



Northeastern University



**School of Law
Library**

INVESTIGATION OF CONCENTRATION OF ECONOMIC POWER

TEMPORARY NATIONAL ECONOMIC COMMITTEE

A STUDY MADE FOR THE TEMPORARY NATIONAL
ECONOMIC COMMITTEE, SEVENTY-SIXTH CONGRESS,
THIRD SESSION, PURSUANT TO PUBLIC RESOLUTION
NO. 113 (SEVENTY-FIFTH CONGRESS), AUTHORIZING
AND DIRECTING A SELECT COMMITTEE TO MAKE A
FULL AND COMPLETE STUDY AND INVESTIGATION
WITH RESPECT TO THE CONCENTRATION OF ECONOMIC
POWER IN, AND FINANCIAL CONTROL OVER,
PRODUCTION AND DISTRIBUTION
OF GOODS AND SERVICES

MONOGRAPH No. 31

PATENTS AND FREE ENTERPRISE

Printed for the use of the
Temporary National Economic Committee



TEMPORARY NATIONAL ECONOMIC COMMITTEE

(Created pursuant to Public Res. 113, 75th Cong.)

JOSEPH C. O'NEAL, Senator from Wyoming, Chairman
HATTON W. SUMNERS, Representative from Texas, Vice Chairman
JAMES M. MEAD, Senator from New York
WALLACE H. WHITE, JR., Senator from Maine
CLYDE WILLIAMS, Representative from Missouri
B. CARROLL REECE, Representative from Tennessee

THURMAN W. ARNOLD, Assistant Attorney General
*HUGH COX, Special Assistant to the Attorney General
Representing the Department of Justice

SUMNER T. PIKE, Commissioner
Representing the Securities and Exchange Commission

GARLAND S. FERGUSON, Commissioner
*EWING L. DAVIS, Chairman
Representing the Federal Trade Commission

ISADOR LUBIN, Commissioner of Labor Statistics
*A. FORD HINRICHS, Chief Economist, Bureau of Labor Statistics
Representing the Department of Labor

JOSEPH J. O'CONNELL, JR., Special Assistant to the General Counsel
*CHARLES L. KADES, Special Assistant to the General Counsel
Representing the Department of the Treasury

WAYNE C. TAYLOR, Under Secretary of Commerce
*M. JOSEPH MEHAN, Chief Statistician, Bureau of Foreign and Domestic Commerce
Representing the Department of Commerce

LEON HENDERSON, Economic Coordinator
DEWEY ANDERSON, Executive Secretary
THEODORE J. KREPS, Economic Adviser

*Alternates

MONOGRAPH No. 31

PATENTS AND FREE ENTERPRISE

BY

WALTON HAMILTON

WITH THE ASSISTANCE OF ELMER E. BATZELL, BORIS I. BITTKER, HENRY KOHN, JR.

ACKNOWLEDGMENT

This monograph was written by

WALTON HAMILTON

Professor of Law, Yale University Law School

WITH THE ASSISTANCE OF

ELMER E. BATZELL

BORIS I. BITTKER, AND

HENRY KOHN, JR.

OF THE YALE LAW SCHOOL

The Temporary National Economic Committee is greatly indebted to this author for his contribution to the literature of the subject under review.

The status of the materials in this volume is precisely the same as that of other carefully prepared testimony when given by individual witnesses; it is information submitted for Committee deliberation. No matter what the official capacity of the witness or author may be, the publication of his testimony, report, or monograph by the Committee in no way signifies nor implies assent to, or approval of, any of the facts, opinions, or recommendations, nor acceptance thereof in whole or in part by the members of the Temporary National Economic Committee, individually or collectively. Sole and undivided responsibility for every statement in such testimony, reports, or monographs rests entirely upon the respective authors.

(Signed) JOSEPH C. O'MAHONEY,
Chairman, Temporary National Economic Committee.

TABLE OF CONTENTS

Letter of transmittal.....	Page VII
CHAPTER I	
Salute to invention.....	1
Function and question.....	1
The art belongs to the artisan.....	4
Technology swaps masters.....	7
CHAPTER II	
The Government assumes an obligation.....	11
In the old country.....	11
Across the Atlantic.....	18
And into the Constitution.....	23
CHAPTER III	
The ages of letters-patent.....	29
Culture shares the invention.....	29
A number of beginnings.....	33
Invention does not ride alone.....	41
Fact forsakes the law.....	45
CHAPTER IV	
Alternative paths for the law.....	51
Rumblings of doctrine.....	51
A man and his own.....	57
Immunity by contagion.....	62
CHAPTER V	
The grant as shield and sanction.....	71
Tolerance of remote control.....	71
Along the horizontal line.....	76
Still the open road.....	80
CHAPTER VI	
Maintenance of the corporate estate.....	87
The telephone—and longevity.....	87
The electric light—and the closed market.....	93
Beryllium—and foreign policy.....	103
CHAPTER VII	
The poles of trade practice.....	109
The glass container—the patent as police.....	109
The automobile—and aloofness.....	115
CHAPTER VIII	
The creation and validation of sanctions.....	123
Norms and procedures.....	123
The court as underwriter.....	129
Process into current usage.....	134

CHAPTER IX

	Page
A policy for the national economy	145
Improvement and betterment	145
To promote the industrial arts	152
The peril to free enterprise	158
Wanted: A policy for technology	163
The release of creative resources	170
Table of cases	177

LETTER OF TRANSMITTAL

HON. JOSEPH C. O'MAHONEY,
Chairman, Temporary National Economic Committee,
Washington, D. C.

MY DEAR SENATOR: An inquiry into the concentration of economic power cannot ignore the patent system. The sanction for "the exclusive right" conferred upon the inventor is the Constitution itself which delegates to the Congress the power "to promote the progress of science and the useful arts." The patent question, however, is not an exclusive affair of technology. The inventor assigns his grant to a corporation; it thus comes under the influence of the usages of business and is employed rather widely as an instrument of offense and defense by the corporate estate. Hence the concern of this monograph is with "Patents and Free Enterprise."

The monograph has been submitted to a number of individuals who in an official or a professional capacity are concerned with the operation of the patent system. The author is under heavy obligation to Mr. Joseph Borkin, of the Department of Justice; Mr. Willis B. Rice, counselor at law, New York; and Mr. Samuel E. Darby, Jr., of the firm of Darby & Darby, counselors at law, New York, for the time they have taken with this manuscript, for a number of fresh leads, and for a host of constructive suggestions. It, however, goes without saying that they have no responsibility for such frailties as this document possesses.

DEWEY ANDERSON,
Executive Secretary,
Temporary National Economic Committee.

MARCH 14, 1941.

CHAPTER I

SALUTE TO INVENTION

FUNCTION AND QUESTION

From the very beginning the National Government has been charged with responsibility for the advance of the industrial arts. In 1787—as the Constitution has it—“We the People of the United States” took steps “to form a more perfect Union, establish Justice, insure domestic Tranquillity, provide for the common defense, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity.” To the Congress we delegated—along with other authority necessary to attain these objectives—the power “to promote the Progress of Science and the useful Arts.” And through the Fathers who represented us on that historic occasion, we specified as the means, “by securing for limited times to Authors and Inventors the exclusive Right to their respective writings and Discoveries.”

The clause assigns to the Federal Government an office in the national economy. It affects technology with a public interest; demands that the Congress encourage its development; outlines the policy which oversight is to follow. The industrial arts are rooted in the long ago, passed on as a cultural legacy, and subject to improvement. As a body of useful knowledge they are the possession of the entire people; from the store of techniques and skills every man may draw as his particular calling demands. But the arts—and the science which feeds them—are not to be allowed to become stagnant; they are to be kept exposed to the contagion of experiment and imagination; and, as an incentive, the author of a device or a process which is novel is to enjoy an exclusive right in his discovery for a limited time. Its span is to be just long enough to stimulate the creative faculties of the man of talent. At the end of a reasonable period his privilege is to lapse and the innovation merged in the parent art is to become public property. Thus invention and discovery are made to serve the general welfare. The private grant is made the instrument of the common good.

The list of powers granted to Congress can be written on a post-card and this clause is brevity itself. It is, in fact, a trifle verbose; for, unlike others of its kind, it not only names the power but sets down a line as to how it is to be exercised. The words “to promote the progress of science and the useful arts” are as concrete as an aim into an unknown future will allow. The clause which specifies the means is wanting in detail; every word offers an open choice among alternatives. “To secure” was a favorite infinitive with the founders of the new republic; but no single road leads to security. The term “exclusive right” is not defined. “Exclusive” as a shutting out of other persons is somewhat less than exemption from the

general law; and "right" is among the the loftiest of political sanctions, powerful at all times to incite dispute, propel argument and touch off conflict. The "limited times" are left of an indefinite length; incentives are among the vaguest of intangibles, and men will not agree upon the number of years of earthly reward necessary to draw forth the genius of the inventor. The question of what is a discovery is unresolved. The provision permits Congress to issue letters patent; it does not forbid it to decree a bounty, to purchase the invention, or to contrive some other arrangement to attain the objective. The clause beginning "by securing" is instrumental; the word "patent" makes no appearance in the Constitution.

So general a clause cannot be self-operative. The Constitution gives a general command and is content to leave its administration to Congress. A task of such a character cannot be executed through a process of deliberation; the endless host of decisions which it invites is beyond the physical endurance of a single body. So Congress, in a single act—which from time to time it has amended—has translated the general command into a series of statutory provisions. In these the patent is chosen as the instrument, the terms under which grants are to issue are laid down, and the privileges which they carry and the obligations they impose are specified. And it has entrusted the detail of administration to a Patent Office, supplemented by a special court of appeals. It is inevitable that, in the exploitation of inventions, collisions should occur. So the courts are kept open to conflicts over claims, and rights cannot be finally accepted as valid until they have been litigated.

Thus has emerged an institution to advance the useful arts. The clause in the Constitution imposes an office and points a direction. The act of Congress translates national purpose into legal command, elaborates standards and procedures, and exercises a continuous oversight by agency. The Patent Office, in an endless stream of decisions, issues or refuses to issue, letters patent. The Federal courts pronounce grants valid or invalid, and appoint boundaries to their competing claims. The constitutional provision is as the statute makes it; and the statute has whatever meaning the stream of administrative and judicial rulings give to it. The law thus lies upon three intertwined levels and overlaps to bring into being a network of usages. It is all an intricate affair, a product of growth and of many men, a creation with many aspects. It lacks geometrical design; it has the symmetry of a thing that lives.

The patent-system, touched off by a line in the Constitution, has become of increasing importance. In government we reach back across the decades for words with which to hallow current undertakings; in science, the latest decree from the laboratory has a weight which discredits authority. The lines of policy were set for it before technology had staged its industrial revolution. As pens were put to the finished document, America was still in the stage of the crafts. It was a country of self-sufficient farms, each almost a miniature economy in itself, fringed by a commerce whose dominant exports were staple crops. Skills were largely of the hand; trades were passed down by tradition; the windmill and the water-wheel timidly disputed the sovereignty of ox and horse as the source of industrial energy. Workmen still came from abroad bringing their callings with them. The machine as we know it was to most

of the signers a matter of hearsay; the machine-process an abstraction hard for Americans to conceive for lack of instances. A new wrinkle occurred here and there in an established art; a discovery was an event rare enough to be noted. But the atmosphere of the new world was dynamic; the spirit of contrivance was in the land; men like Dr. Franklin and Mr. Jefferson were not above tinkering in projects. Science might still be a minor term in the equation of the general welfare; but in respect to the useful arts the fathers did not propose to stand on the status quo. In the Constitution they gave the bugle call for the show which invention and discovery were about to put on.

As events took their course, the patent system came up in the world. A division of labor cleared the way for the coming of the machine. A handicraft was broken down into its elements; each was discovered to be a routine operation; at a task whose requisites are precision and repetition a machine is as good as a great many men. As a source of energy old Dobbin—and even that synthetic animal called the mule—was found woefully inadequate compared with gas, coal, or oil. The skills of the workers were built into a complement of machines, and metallurgy was drawn into the service of the productive process. The electric spark and the vacuum tube, the dynamo and the internal combustion engine, caused old arts to atrophy. Physics, chemistry, biology, bacteriology were enlisted in the service of invention and an advancing science kept technology on the move. Hardly a method of production has been able to stand out against new processes; and so breathless is the march that novelty falls into jeopardy before ever it gets established. As trades have become industries, loosely articulated into a system, the industrial arts have become the foundation of a national economy.

As a result access to the store of useful knowledge has become a requisite of free enterprise. It is as essential to the venturer into an industry as fuel to the engine, food to the laborer, or breath to animate life. A man may possess drive, intelligence, and capital; he may be able to command labor and bund up markets. Yet, if he is denied access to the necessary techniques, such assets are to him of no avail. And, where science prods an art along, a liberty to use established methods may still leave him at a hopeless disadvantage. A concern must keep its technical processes up to date or fall behind in the competitive race. It is the rare invention which lives out its statutory period of protection and becomes common property before it is discarded for a revised edition of itself or is ousted by a sheer upstart. The whole economy has come to rest upon a scientific technology; and, with its rapid progress, innovation lies like a blanket over the intricate fabric of modern industry.

Accordingly the multifarious actuality known as the patent system invites critical appraisal. It is under this system that creative incentives are released, that discoveries are protected, that arts-in-transit serve the public interest. Here it is to inquire what the system is, how it came about, what usages make it up, how it operates. As an instrument, has its sole concern been to promote the progress of science and the useful arts? Has it been diverted to other purposes which are no part of its constitutional intent? How far has it left undone the things it ought to have done? How far has it done what it ought not to have done? Where does the balance lie? How can its per-

formance be improved? Its activities be kept in service to its office? The Congress is charged with making the industrial arts the instrument of the commonwealth. How well is this function of government being performed?

THE ART BELONGS TO THE ARTISAN

It is only upon the most primitive level—in at all—that the needs of man are satisfied directly from Nature. Early he begins to interpose tools and methods between the wants of his organism and his environment. He forges crude weapons with which to bring down the deer; he contrives a boat and a net to enlarge the sources from which he may have fish; he discovers simple processes by which to break grain into bits, press grapes into wine, and keep meat from decay against the winter. A mite of knowledge lies at the base of each of these inventions; as it grows and is turned to use, each becomes an industrial art. As those increase in number and intricacy man converts more and more of the great unknown to his own account. There is no surer index to the quality of a culture than the state of its industrial arts.

We can know little, save by inference, of early inventions. Fire, the hammer and the ax, the basket and the stone-jug are in use when the records of history begin. We cannot set down the incentives which drew them forth and the steps in the mental processes out of which they emerged. But the evidence from primitive cultures within which the useful arts are painfully set upon their way indicates that it was no conscious process directed at a definite result. A neolithic man could not have taken ore and have said "Let there be iron" when he had never heard of iron. Nor could he have fashioned a chisel, a wheel, or a long bow when such things were alien to his mind and world. The first vague promptings doubtless came from Nature; a vague notion, a stroke or two, a bit of luck decreed the start. A dried gourd into a dipper; a pointed stick into a spear; a log—hollowed and shaped—into a canoe; these are gigantic, but not impossible, leaps for the untutored mind. Yet each of them led its culture over a horizon.

The initial idea was the urge; once a beginning was made, the carry-on would in time take care of itself. As life goes its way, small variations in its daily round are inevitable. Each mutation presents some slight difference in result, and among the people there are some who will observe, repeat, and learn. As tribes are thrown together, in trade or in war, a process of borrowing is inevitable and in some fertile mind elements from two cultures unite to form a tool or a technique not known before. An exposed tribe is more tolerant of innovation than an isolated one. A crisis demands expediences which, when the event is passed, are not forgotten. A people who have a history are disturbed more in their customary ways than another to whom each new year is like the last. One art advances through a series of minute changes; another goes forward through leaps of the kind which biologists call sports. A technique may even shift its base entirely. As peoples mingle, their ways mix; even where change is slow, little is ever preserved in its pristine purity. Events and the social order are creative forces; but it is only as some mind gets a novel idea that they feed the stream of knowledge.

A primitive folk impresses its own character upon its arts. Its tools are few in number and simple in form. Each in the hands of its workman is a generalized instrument. A knife with a single blade serves many uses. A Zulu will use an untrimmed lump of sandstone to clean his feet, polish the shaft of an assegai, scrape an antelope skin. Its multiple function has been incorporated into its structure; its employment remains at large. It lacks precision in its own right; the neatness and dispatch with which it operates depends upon the nimbleness of the person wielding it. The finer wood carvings of the Maori rank with anything of their kind, yet they were all done with stone tools. A primitive craft leaves skill to the worker; it puts a premium upon nimbleness of muscle, coordination of hand and eye, tricks of the trade which are never modeled into wood or metal. A new method of spearing a salmon, lassoing a steer, or paddling a boat is as truly an invention as an ax or a spinning wheel. The workways which go into an oriental tapestry are of far greater significance than any instruments which the worker employs. Such inventions are passed along from generation to generation as knowledge is passed along among a people who have not become literate. In a museum we may observe the tools of many a former culture; their techniques, too intangible to leave any material remains, are lost arts to us.

Until well after the discovery of America skill continued to dominate technology. As tribal life became more complex, persons began to specialize, and a bundle of skills came to constitute a man's craft. Although members were brothers in the trade, a rivalry in workmanship was not stilled. As day followed day men were accounted excellent, competent, or poor at their tasks. The person who was deft at his craft, turned out a superior ware, or invented a new wrinkle, played for the admiration of his fellows. A trade which enlisted the instinct of workmanship could not escape its occasional innovation. But tools were simple, fixed by tradition, easy to possess; techniques, never inherent in the instruments, were visible only in application; a novelty emerged through its incorporation into someone's scheme of working habits. Technology was useful knowledge, which found no expression apart from the practice of a trade. The craftsman stood at the center of his industrial world.

It is not easy for us, from our alien culture, to understand the richness and intricacy of these techniques. A trade had its complement of tricks which only the skill and learning of the workman can turn into an art. Among primitive people the practice of useful knowledge had often been a priestcraft; and until the Middle Ages were far gone, the crafts were still mysteries, whose secrets were closely guarded. The workers in wood, cloth, leather, constituted a fraternity. Among the brothers the severities of the economic struggle are relaxed and a united front is maintained against the outsider. An oath, a ceremonial, a collection of symbols, the favor of a patron saint, a contact with the Deity envelop the trade with a religious rubric and wrap its privileges in sanctions from on high. A "savage" tribe has a single secret society, or at most one of warriors and one of priests. As an intricate web of folkways is spun, the cult, amoeba-like, divides and thus multiplies. In the England of the fourteenth century, butchers, drapers, carpenters, and a host of smiths, mongers, and masons put on miracle plays which sanctified and advertised their sacred callings.

And there were enough of these mysteries to present a pictorial edition of holy writ. In their aggregate the craft guilds presented the social structure of the English town.

In their profession of aims the general welfare is strangely mixed with that of the brotherhood. Their charters consecrate their crafts "To the worship of God and of Our Lady Saint Mary, and of St. John the Baptist, and of all saints."¹ Their ordinances profess great solicitude for the user of the ware, for excellence in workmanship, for honest weight and high quality, for reasonable price. The practice of the art is a monopoly of the brotherhood. Admission to the trade is severely limited; for the novice a 7 years' apprenticeship is the test of fitness. The doors are rigidly closed against the stranger who would invade the trade. An ordinary calling belongs to as tight a company as that of the clergy or the doctors of physic. For "the well ordering of the trade," the guild is a self-governing body, with the power to discipline its own members; the perquisites of the craft—claimed not for a term of years but in perpetuity—are boldly asserted and valiantly defended. An industrial art, inseparable from the mind and skill of a workman, is a body of trade secrets; as such it is the exclusive property of the fraternity. A code of ethics, a doctrine of responsibility, a catalog of lofty professions cloak the liberties from which men "not of the guild" are excluded. A rhetoric which has outlived its employment sets it all down in terms of "the common good."

As the guilds, overreaching themselves, fell into decay, the Crown usurped its office. The King's favor is among the oldest of political usages, and commerce is far too important to lie beyond its ambit. A series of acts of Parliament regimented various trades into the commonwealth;² and the royal prerogative—which it took a century, a civil war, and a "silent revolution" to tame—obtruded into the affairs of industry. For the profit of the realm, to introduce a new ware, as a special favor, or without reason at all, His Majesty granted to worthy persons, goodly companies, or honorable corporations exclusive rights to certain trades or control of particular commodities. Since such privileges were likely to be challenged, written evidence was needed, and such favors fell into the form of grants of letters-patent. Such a certificate of privilege served a miscellany of purposes. The King was His Gracious Majesty, and it was as broad as his favor.³ A technique of production was thus often made a personal property; and its owner had recourse to a court called Star Chamber to prevent trespass upon his grant.⁴

The royal grant threw into sharp relief a trend long in the making. As the companies gained wealth and power, a hierarchy arose to compromise their pristine democracy. The master came to dominate a closed trade and to decree the terms under which workmen might practice their callings. As often as not the grants of monopoly went

¹ The particular saint, of course, depends upon the craft. University of Pennsylvania, Translations and Reprints from the Original Laws of European History, vol. II, n. 1. English Towns and Gilds, p. 26 (1466).

² Edgar S. Furniss, *The Position of Labor in a System of Nationalism*; Hecksher, *Merchantilism*, vol. I, pp. 221-226 (1935).

³ The royal favor begets the royal favorite and becomes an incentive to curb the royal favor.

⁴ Terms do not easily carry across the centuries. But an action for trespass on the case is roughly equivalent to the modern suit for infringement. Only a scanty sheaf from the voluminous records of Star Chamber has been published. Until that mass of materials has been worked over, we cannot tell how widely and severely it was used to guard the close holdings in the industrial arts.

to persons ignorant in the mystery; their issue separated the right to the trade from the practice of the art. The letter with the royal signature thus became a solitary privilege to employ a particular process or to fashion a specific ware. Its recipient, to the exclusion of all others, is accorded a license to make and vend alum, saltpeter, or playing cards. A new ware is introduced or a novel occupation encouraged, by conferring upon artisan-author or workman-importer exclusive rights for a period of years. The whole of the art is comprehended in the grant—skills which human hands, not material instruments, must practice. A grant of letters patent serves a score of public uses and twice as many royal whims. Amid the miscellany is to be discovered the instrument by which claims were recognized to private property within the domain of the useful arts.

TECHNOLOGY SWAPS MASTERS

The term "industrial revolution" is shorthand for the myriad of influences which deprived the craftsman of his industrial throne. It began long ago, moved quietly through various aspects of life, gathered momentum in the late eighteenth century, and still goes roaring through the decades and into remote lands. It appeared far off-stage, as ideas of quantity, precision, cause and effect. It became more explicit in the calculus, Newton's laws of motion, the operation of the money economy, the conversion of the Christian universe into a world of law and order.

In time the system of handicraft fell back before the rush of idea, shifting usage, and seething event. The market for wares of trade was expanded by ventures overseas; the size of the shop was enlarged; the number of workers was increased. The stage was set for a revision of the process of manufacture. The art was broken down into its elements; the worker was assigned a specific act in a sequence; an aptness at a single operation replaced the mastery of a mystery. The division of labor, about which Adam Smith spoke such words of eloquence,⁶ by its analysis of an industrial process, cleared the way for a machine. Knack had given way to a repetitive precision, and the unstandardized human being was hardly built for so mechanized a task.

But a craft is a multiple affair, and it took a number of machines to assume its complement of tasks. A single machine could hardly go it alone; if speed, exactness, quantity, came in at one point in an industrial process, it could operate only with a serious loss of efficiency if the step before or the step after were left in the grip of handicraft. It takes the output of a machine to feed a machine; a machine loom demands machine spindles; the busyness of spindles causes the demand for the cotton-gin. It takes machines to make a machine; and, as industrial processes intertwine, at points of contact between handicraft and mechanized technology, the gears clash as they engage. The urge toward the machine is contagious; the crafts had to take a declining place within the emerging industrial order.

Inert as it is, the machine has a will of its own. A creature of human intelligence, it can also command. It is easy to talk of the machine as

⁶ *An Inquiry Into the Nature and Causes of the Wealth of Nations*, bk. i. ch. (1776). It is of note that the detailed discussion of the "division of labor" and the merely incidental reference to the machine dates the book in the chronology of the progress of the industrial arts.

stripping from the worker his skills. But if a-way-of-doing-it is incorporated into a series of mechanisms, which only need to be tended, the need for human guidance is not far off. The craft survives in the learned professions; a goodly number of old-fashioned trades still exist; it takes a number of disciplines and quite an assortment of skills to keep the factory system going. It is easy to underestimate the technical knowledge which the ordinary man working about machinery must possess. The plumber, the electrician, the automobile mechanic, the linotype operator practice no simple art; any one of them may meet an emergency which calls for the kind of a hunch which only wide experience can give. Yet, for all of that, the craftsman no longer plies an independent art. The newer technology has nowhere quite taken over; vestiges from the older ways appear in its most advanced patterns. Manual skills supplement those caught up into the precisions of mechanics. The movements of the machine operator become the subject of investigation by experts in time and motion study. A human engineering makes stark reality out of the fanciful analysis of Thomas Hobbes.⁶ The shift of emphasis transforms the character of useful knowledge. It no longer exclusively resides as once it did in trade lore, in habits of work, in the person of the craftsman. It has been abstracted from him, conceived as a sequence of operations, and incorporated into an apparatus or process. A machine, or a complement of them, is an instrument so arranged as to secure from specified materials a prearranged result. It stands as a material expression of human knowledge, an aggregate of wheels and levers and gears, its productive function frozen into its structure of wood and metal. The process is freed from its craft; it is made independent of the workman; it is given a quite impersonal existence. It can be set down in a series of blueprints, passed from person to person, dispatched through the mails, legible to all versed in its graphic language. It can be translated into a model which, with a few notes of explanation, display a production process.

As a result invention enters a novel intellectual climate. The world about us is as our knowledge makes it; dodges and devices are keys to the storehouses of human and material resources. The machine-process enlists science in the service of the useful arts. In the wake of physics and mathematics followed chemistry, biology, biochemistry, bacteriology, economic geology as sources to refresh an advancing technology. The basic work of the laboratory is for the Michael Faradays rather than for the Thomas Edisons; it lies too remote from the market-place to be directed by the urge for gain. It opens vistas and explores paths which the inventors who follow must reduce to possession. In ideas and techniques they have untold riches with which to work. Novelty emerges from the combination of idea with idea, the transfer of a technique from one trade to another, the adaptation of an instrument to an alien product, a shunting of a process toward an unfamiliar objective. In days of old innovations emerged from the clash of cultures; among the Chinese the explosion of gunpowder served a religious ceremonial with a mighty noise; in the feudal culture of the West it came to propel a missile against the enemy. In our times, provinces of human knowledge overlap and through creative minds elements from sources apart are fused into

⁶ Hobbes, *Leviathan*, Introduction, xl: (Everyman's ed.).

processes and contrivances hitherto unknown. The state of culture invites putting two and two together and getting a series of variations upon the theme of five.

As ideas are fused, novelty gets endowed with degree. Here and there appears a discovery so fundamental as to create a fresh base for an old art or to establish a new one. The microphone, the electric circuit, the vacuum tube are conscripted into a conspiracy by which a broadcast brings the performance of a symphony to the people of a nation. More often a developed technique is given new industrial employment. A technology imported from radio renders obsolete the large horn and the vibrating needle by which music was accorded a faint and noisy immortality upon the phonograph record.⁷ Quite usual is the revolution of an art through almost an infinitude of minute stages. A succession of finite steps has bridged the great gulf between the snapshot and the motion picture in technicolor. Most common of all is the emergence of an improvement through the mere union of two or more well known devices. A surgeon uses a knot he had learned as a canal boy; the X-ray through slight changes in apparatus is employed all the way from internal medicine to watch repairing; a manufacturer takes over the whole technology of automobile bodies to the construction of railway coaches. Creation arises from a union of familiar things; knowledge must select from among possible permutations; and, where their number is legion, learning, experience, or a rarer gift must direct a continuous process of choice. A culture like ours is fertile to invention; a host of individuals, very differently situated, is exposed to the contagion; novelty is touched off by a talent which ranges from sheer genius to a mere mechanical gift. Amid such cross-currents of understanding, the contribution of the individual to the advancement of an art can hardly be sharply defined.

A like disregard of industrial boundaries attends the use of inventions. In a society that is gone the tricks belonged to the trade. The cobbler, draper, tailor, each employed needle and scissors; but instruments of a common kind occupied different places in the several crafts. An industry still has its distinctive technology; but the employment of a device may cut horizontally across a number of domains. A vacuum tube is used for phonograph records, radio broadcasting, amateur reception; the electric circuit, in its many variations, is the instrument of many activities. A single factory makes use of a bewildering array of techniques; a single technical principle is put to work at a hundred different jobs. The lines of the industrial arts run with, depart from, cut across those which mark out the design of industry. As matters now go, technology is not an aspect of labor; it is severable from "ownership" and management; in the economy it has come to stand in its own right. It can, apart from the man who employs it and the establishment in which it is put to work, become property, be transferred like other chattels, enjoy legal protection in its own right.

Technology has taken a distinctive place in an industrial culture; with the implications of its ascendancy the pages which follow are

⁷ The art of invention has its moments of irony. Once upon a time Thomas Edison tinkered for a day or two with the vacuum tube and decided that something was there. At the time he was engaged in perfecting the marial phonograph and was not to be diverted from the serious business in hand by idle curiosity.

concerned. A kit of simple tools, well within the means of the ordinary workman, is replaced by a complement of machines which only investment can supply. The craftsman becomes a factory hand, living by his earnings, and drawn into a wage system. The technician—whose task is to devise, to improve, to keep machinery going—becomes an essential functionary of industry at work. His skills are rather employed in anticipation of production than utilized in its process. A management—as often as not divorced from those who venture with their own money—is no longer a corps of master-workmen; its skills have come to lie in finance, in oversight, in knowledge of markets, in competence at purchase and sale. Its tasks are to cut expense, improve goods, puff wares, tempt with tempting points. A new device, a mutation on an old method, a novel product, an innovation in process or article becomes a card of consequence in a business game. Access to an industrial art became a requisite of corporate life; a denial of access to rivals became the way to dividends and growth. An appraisal of the current scene makes the state of the industrial arts the factor of greatest consequence in the national economy. An insistent question of public policy concurs our technology, the ways of its control, the instruments by which it is directed to the general welfare.

CHAPTER II

THE GOVERNMENT ASSUMES AN OBLIGATION

IN THE OLD COUNTRY

As current opinion has it, the patent and the invention are to each other as incentive and achievement. Yet it is usage, grooved into thought and grounded into the law, which makes inevitable the connection between them. It was not to prod the sluggish industrial arts along their way that the grant of royal favor came into being, and the trade-ways had managed somehow to advance before the King's prerogative was ever enlisted in their progressive cause.

The patent, as an encouragement of technical advance, came slowly into being. The King's pleasure is as venerable as his authority; it had from olden times often been invoked to bestow office, issue a pardon, guard privilege against trespass, and even to create the right of taxation. In due time it appeared a suitable instrument for an increase in the wealth of the realm. Britain was situated on the rim of Christendom; its useful arts were few and primitive by comparison with Flanders and Florence. If fame and power were to come to the commonwealth, the trades of Merry England must be quickened and multiplied. In 1331, a certain John Kempe, a weaver by calling, just out of the Low Countries, was promised the King's protection in return for teaching his art to Englishmen. The grant was not exclusive;¹ a like protection was specifically promised to others who would bring their crafts from overseas. The instance contained its implication which ripened into a policy. A kindred privilege was presently extended to some clock-makers from Delft. As the patent moved into its industrial office, again and again groups of skilled artisans were lured to the humid little island; and a country made up of sheep runs was headed toward its destiny as shopkeeper to the world.

The "letters" granted to John Kempe were little more than a passport. They conferred upon him the privilege of entry and the right to ply his trade. But no monopoly of his craft and no immunity to authority was granted. He came into a country possessed of its own usages; as denizen and artisan he was expected to abide by the customs of the town and the law of the land. At the time industry was still under the control of the guilds; they set standards, solemnly passed ordinances, provided for the government of their trades, punished breaches of discipline—and the patentee was expected to conform to the rule of his mystery. The liberties granted were manufacturing, not commercial, in character; the purpose was to promote new arts, not to vest interests in old ones. The privileges were surrendered by the Crown in the public interest; the artisan from across

¹ C. T. Carr, *Select Charters of Trading Companies* (Seldon Society Publications, vol. 28) Introduction, p. 56.

the water was a pawn in a game of national greatness. It was the King's realm—and his good people—that stood to gain.²

The patent was not at once fitted to its office. As a single one among many, its privileges were not sharply set off from other manifestations of the King's favor. The need of the Crown for revenue was met by the sale of grants and letters issued where arts were neither to be imported nor advanced. A control over a commodity, entrusted to the King's favorite, became in practice a private right to levy toll. A catholic range was accorded the word trade; the monopolies created by the Crown extended to the very fringes of useful knowledge. Thus in 1456 Henry the Sixth took certain persons under his especial protection and sent them forth to seek the Philosopher's Stone. The good people of the realm needed a sanction with which to stop one-way grants, trim away irresponsible growth, and hold the patent to its public purpose. The memory of man responded to Coke's prompting; the grant of letters patent was circumscribed by the common law; and precedent and recollection were defied to recite anything to the contrary.

As early as the reign of Elizabeth the supremacy of the law began to be asserted. The grant of letters patent was distinguished from the charter of the guild. The liberties of the Brotherhoods of joiners, drapers, cordwainers, fishmongers descended from "of old"; rested upon custom or act of Parliament; were the perquisites of semi-public bodies. The letters patent were legal upstarts. Their origin lay without the rightful province of the King's prerogative; their privileges were exercised by individuals who could be held to no strict responsibility. The charters were of long standing; experience had set practical limits to their powers; their structures had been woven into the fabric of use and wont. Their perquisites, however extravagant they may once have been, had become vested. The patents, hot from the throne, were clumsily thrust into a going industrial order in careless disregard of ancient rights. They were not easy to assimilate; their exercise was often attended by friction; an appeal to the courts was frequently necessary to prevent trespass upon their preserves. The infringer was hailed not into a court of common law but to appear before the Chancellor. Adjudged "in contempt of the Queen's command," he might well feel himself the victim of arbitrary justice. A private suit, resting upon a royal sanction, thus early came to be the accepted remedy in a matter of public concern.

As a Tudor, Elizabeth drove a hard bargain with those with whom she dealt. She made certain of a reasonable return, to the realm as well as to the Crown, for favors handed out. To secure a grant, the patentee must possess a method that would work, give employment to some native labor, and maintain a reasonable price. As, however, the need for revenue became acute, the alien with a novel trade had to perform as it was denominated in a very strict bond. The native, be he a courtier—especially if equipped with ready and adequate cash—was accorded a measure of indulgence. As an empty exchequer made Her Majesty even more gracious, the right to take a toll was sold as a grant of patent. Even then a nominal respectability was maintained and an instrument of exploitation was blessed with public purpose. By the licenses through which he gave effect to his patent,

² As the Year Book tells us, "Ex auxy le Roy come chiefe gardain del common wele ad power et auctority per son perogative, de graunte mult des privileges."

Raleigh strove to prevent the sale of "corrupt, mingled, and unwholesome wines." In his strict oversight of tanners, Dyer attempted to counteract "words inaptly placed in the statute" concerned with the trade which were clearly "contrary to the good meaning of the law-makers." Cornwallis was solemnly charged by his sovereign to issue licenses to "honest croupiers" only. A distinction between offices of state and private enterprises was not always respected; some grants went so far as to delegate legislative powers to private parties; individuals who had bought the Queen's pleasure might, at their discretion and to their profit, license inns and gaming houses. In the end came grants unabashedly made "in consideration of the true and faithful service" rendered to Her Majesty by some groom or "ancient domestical servant."³

As vigilance was relaxed, patent came to be another word for monopoly and a crescendo of abuses touched off strong protest. In times past Elizabeth had been able to prevent the discussion of issues "which pass the reach of a subject's brayne," such as her marriage, the succession, the government of the church. But she seemed unable to contrive ways of escape from the mounting volume of complaints. At first, in lofty detachment, she justified "her prerogative, which is the chiefest flower in her garden and the principal and head pearl in her crown and diadem." If formally she neither heeded a popular demand nor recognized constitutional bounds to her authority, she promised, by her own pleasure, to leave the monopolies "to abide the trial and true touchstone of the law." Francis Bacon put the case for his queen in the persuasive rhetoric of the common law, "If any man out of his own wit, industry, or endeavor, find out anything beneficial for the commonwealth, or bring any new invention, which every subject of this realm may use; yet in regard to his pains, travail, and charge therein, Her Majesty is pleased (perhaps) to grant him a privilege to use the same only by himself, or his deputies, for a certain time. This is one kind of monopoly."⁴ By leaving the matter to be tried at common law, Elizabeth averted an act of Parliament; and the law could ask no more appropriate formula than that preferred by her minister. In instances she was compelled to go further; but, even in a reluctant cancellation of the most obnoxious grants, she made it plain that she waived no right of the Crown.

The resort to law, thus invited, came almost at once. One Darcy had been given a patent which secured to him a monopoly in the manufacture and importation of playing cards. As with many such grants, he had been invested with the power of police and the right of search and seizure. Thus, legally equipped, he raided the premises of a certain Allen, a haberdasher by trade, and discovered thereon contraband goods. In retort Allen brought two cases for trespass; Darcy threatened imprisonment for prosecuting actions in contempt of the royal grant; Allen withdrew his suits. Darcy then took the offensive and sued for infringement. Allen's defense, as reported by Coke,⁵ was a forthright attack upon the validity of the royal grant. The letters patent, in appropriate words, set forth that "Queen Elizabeth, in-

³ Carr, *Select Charters*, Introduction, p. 65 ff.

⁴ The instrumental character of the grant and the anticipation of the language of the Constitution are too obvious to escape attention. Note that towards the end of the sixteenth century the exploitation of a patent through deputy was already established practice.

⁵ See Carr, *Select Charters*, Introduction, p. 66.

tending that her subjects, being able men to exercise husbandry, should apply themselves thereto, and that they should not employ themselves in making playing cards, which had not been any ancient manual occupation within the realm, and that by making such a multitude of cards, card-playing was become more frequent, and especially among servants and apprentices and poor artificers; and to the end her subjects might apply themselves to more lawful and necessary trades," granted the exclusive right to Darcy, a groom of the Privy Council.⁶

The judiciary, not loath to enlarge its jurisdiction, eagerly accepted the action. The plaintiff admitted a man's right to his trade as the rule of the common law, but pleaded the validity of the exception when conducive to the commonwealth. He insisted that a restrictive grant was legal if the recipient introduced a new trade, or a guild regulation was essential to order, because the interest of the nation was at stake.⁷ He passed on to urge that cards, being "things of vanity," were under the parental oversight of the Queen;⁸ that the royal prerogative extended to articles recreational; and that, since the whole included the part, the power to prohibit the use of cards altogether—in order to prevent their abuse—comprehended the power to prescribe the terms upon which they might be made and sold.⁹ The argument *contra*, by the attorney for the defense, proved persuasive and was recited by the court as the law of the land. All trades which prevent idleness—the bane of the commonwealth—and "exercise men and youth in labor" are profitable to the country; the end of all these monopolies is for the private gain of the patentees; the Queen was mistaken in thinking the grant would be for the public benefit. It followed that the instrument was void at common law; but the court,¹⁰ with gracious tact, set the grant down as contrary to the intent of the sovereign rather than outside her prerogative.¹¹ Allen's attorney had urged that the common law derived from that which was divine; and Coke, who never objected to grounding a judgment upon so ultimate an authority, was content with the statement, "Thou shalt not take the nether nor the upper millstone to pledge, for he taketh a man's life to pledge: whereby it appeareth that a man's trade is accounted his life, because it maintaineth his life; and thereby the monopolist that taketh away a man's trade, taketh away his life."

Meanwhile James I had come to the throne. The decision in the Darcy case had given a legal sanction to the growing unrest; and, warned by this, the King suspended all monopolies save those of the trading companies and the guilds. But he was beset by a continuous

⁶ Note how neatly this recitation fits into the prevailing policy of nationalism. Cards, like other luxuries, are to be kept out of the hands of laborers, lest they be tempted from industry. See Edgar S. Furniss, *Labor in a System of Nationalism*. The objective of the grant is avowedly the protection of the public morals. It is an expression of an attitude, soon to become manifest in Puritanism, which aims to create scarcity in respect to goods of illth. The same attitude finds expression in our high taxes on whisky and tobacco, which were originally justified as tending to discourage their use.

⁷ At the time England was coming up in the world; the era of competitive nationalism had already begun: the strength of the realm was becoming the dominant value in mercantile policy. The move toward a "totalitarian" attitude was accentuated by the struggle with Spain and sharply dramatized by the incident of the Armada. At the time saltpeter, ordnance, and like essentials of national defense were under strict royal control.

⁸ The Latin is, *paren's patriae*. Pater might have been employed had there been a king, but note the reluctance to use *pater*.

⁹ That, in respect to rights, the greater comprehends the lesser, seems to be among the oldest of legal fallacies. In respect to patents it occurs again and again. Only recently it was argued before the United States Supreme Court that the right of a patentee to refuse a license comprehended the right to dictate whatever conditions he pleased. *General Talking Pictures Corp. v. Western Electric Co.* (Brief for the Appellee, 304 U. S. 175 (1938)).

¹⁰ According to Coke, "Popham, C. J., et per totam curiam."

¹¹ The Latin terms are "*contra intentionem*" and "*ultra vires*," the latter an accepted idiom of the common law.

need of revenue; he thought of the royal prerogative in terms of divine right; he had more than a human knack for doing the unpopular thing. A new court was gathered, another crop of favorites appeared, a new flood of patents issued. In their support the Star Chamber—a tribunal which identified the King's pleasure with justice—resumed its ancient role. Presently John Pym cried out against it as "an instrument of erecting and defending monopolies, to set a face of public good on things pernicious." The rule of the exchequer supplanted that of the regular process of justice; and Coke demanded that monopolies be tried "according to the common law, and not at the council table, star chamber, chancery, exchequer chamber." The grant of patent became a single aspect of an issue of mighty concern. It was a counter of consequence in the attempt of Parliament to confine the royal prerogative within what was coming to be called its constitutional limits. In 1624, long before that struggle reached its climax, Parliament answered the country's petition for redress of grievances by passing the Statute of Monopolies.¹²

The act of Parliament was not a clear-cut declaration addressed directly to its subject. A product of the legislative process, it reflected all the pressures which had converged into its classic and compromised lines. In title and in general form it was a response to the general demand for reform. Its larger exceptions were concessions to established practice or to the demands of mercantile policy. Its detail of saving clauses represented vested interests which had to be placated if the measure was not to be defeated. A strong support came from members who, sheltered by exemption and immunity, were anxious to prevent fresh grants which might put their own perquisites in jeopardy. Instruments which Parliament itself had sanctioned were free from its blight. The statute was not intended to encroach upon the operations of government; hence the integrity of charters to municipal corporations were left untouched. And, since they were semi-public agencies through which the commonwealth carried on, the exception was extended "unto any corporation, fellowships of any art, trade, occupation or mystery, or to any companies or societies of merchants within this realm erected for the maintenance, enlargement, or ordering of any trade or merchandise." This provision was regarded by Bacon as no more than "a gull to sweeten the bill withal, it is only to make fools fain"—yet an earlier bill had failed for want of just such a concession. And certain activities, which the prevailing policy of mercantilism particularly affected with a public interest, were left untouched.

Its advocates professed for the statute nothing new. They insisted that it did no more than declare the established and fundamental law of the land; what was set down was as it had always been from earliest days. It recited the ancient ban upon "the sole buying, selling, working, and using of anything"; gave to any person or persons who might be "hindered, grieved, disturbed, or disquieted" on pretext of a royal grant, a right of action for threefold the amount of the damages and double the costs sustained; and provided that all such suits "should be forever after examined, heard, tried, and determined by and according to the common laws of the realm and not otherwise." Thus the statute gave a legislative statement to the rule against

¹² 21 Jacobus 1, c. 3 (1624).

restraints; elevated the common law above the royal prerogative, and took from the defense the right to plead a grant of monopoly from the Crown in a suit at law.

In this setting the patent, as an instrument of the useful arts, receives its initial legislative sanction. A provision of the statute authorized a grant for 14 years "to the first and true inventor" for "the sole working" of a new manufacture. In the phrases "sole working" and "first and true inventor" appears the genesis of current usage. The royal grants had not clearly separated the inventor from the importer, and neither was sharply distinguished from the mere recipient of the King's favor. Now it was made evident that the consideration for the grant was the benefit to the commonwealth resulting from the invention. A neat calculation limited to the reward to 14 years, just long enough to induct two sets of apprentices in the novel mystery.¹³ Already ideas were stirring, and the shift of emphasis from borrowing from abroad to discovery at home reveals the growing significance of experimental effort. The legislative formula balances exploitation for profit against technical advance to serve an expanding economy. A symptom of a changing attitude is the increasing importance of a specification of the invention. Of old a description was not required, nor could it be had; the sequence of acts which make up a process resided in the practice of a manual art. It might, in a sort of abstract way, be explained in a pamphlet or a letter; it could not be exhibited as a model. The clause invited the curious to tinker and to devise projects; it pointed toward a machine process.

The statute was the event which lived in policy; the incidents which followed fall into place in the struggle to subdue the divine right of kings. The corpus of saving clauses opened roads to broad interpretations; and Charles the First invoked their sanctions for a grandiose adventure into arbitrary rule. He issued proclamations, exploited the power of incorporation, kept in service the Star Chamber, and turned loose a host of new monopolies. A decade and a half after the act which was to end abuses, an observer wrote:¹⁴

After wee were risen I went into the Howse where sate the grand Committee for Grievances, and then weere divers witnesses in examination about Mr. Squibs patent for cardes, being a Monopolie, how hee had violentie broken into ther houses, taken away cards readie made, and ther stamperes to make them by: and raised the price of cards from 3d a packe to 9d a packe. Then was Mr. Squibb and one Mr. Thomas May a messenger whome Squibb had imloied called in: and ordered that they should no further prosecute.

Again the same person states that a Sir Nicholas Crisp was discovered to have patents on coperas and gold stones—

soe it was voted that he was a Monopolizer; and unfit to sitt as a member within this Howse.

At that time Parliament had no brotherly love to waste on the patentee.

¹³ "the reason wherefore such a privilege is good in law is, because the inventor bringeth to and for the commonwealth a new manufacture by his invention, cost and charges, and therefore it is reason that he should have a privilege for his reward (and the encouragement of others in the like) for a convenient time: but it was thought that the times limited by this act were too long for the private, before the commonwealth should be partaker thereof, and such as served such privileged persons by the space of 7 years in making or working of the new manufacture (which is the time limited by law of apprenticeship) must be apprentices or servants still during the residue of the privilege, by means whereof such numbers of men would not apply themselves thereunto, as should be requisite for the commonwealth, after the privilege ended." Coke, Institutes, third part, ch. 85. All patents to be granted in the future were limited to 14 years; those already in existence were not to last longer than 21.

¹⁴ Sir Simonds D'Ewes, Journal (Notestein ed.), pp. 68, 312.

So strong was the sentiment against patents that Charles found it expedient to beautify his grants with an appropriate ceremonial.¹⁵ A dignified body was to inquire into the novelty and merit of the invention and to recommend. Thus the Court of Aldermen compared the cleansing virtues of soaps made by rival applicants for patents and reported that the new soap, "if it be used by skillful washers" was suited to coarse linens, but that the older product was the better fitted to fine work and was the more popular among washerwomen. But the King—intent upon chartering the new soap and reluctant to go forward without technical warrant—ordered another investigation; and testimonials from the Lord Mayor, countesses, viscountesses, and "common laundresses" proved the new soap "good, sweet, and serviceable for our people." The power of "the society" thus endowed was gradually augmented from the right to exploit a new process to a right to sell all soap for all purposes. In time it became plenary, with a grant of authority to seek out, confiscate the goods of, and punish infringers.¹⁶ But royal favor was fickle, popular patience limited; the patentee presently surrendered its charter—which was promptly bestowed upon a company which had refused to respect its privilege. History does not record whether new testimonials from the Lord Mayor and the countesses sanctified the transfer. Already custom had begun to decree some sort of inquiry and royal research was off to a fumbling start.

One other aspect of "ancient usage" deserves a word. It is obvious that a patent insures little privilege unless it is adequately policed. As late as the seventeenth century the honorable company remained an instrument of public order. There was nothing improper in endowing such a body, as an agency of state, with powers to investigate and to punish. The Christian Church had its inquisition and its courts; the universities had their statutes and jails; the College of Physicians of London possessed summary powers to discipline those who practiced physick or dispensed drugs without their license. The chartered companies, with their gentlemen adventurers, went forth overseas equipped with almost all the attributes of a sovereign state. It was accordingly fit and proper to confer upon the recipient the authority necessary to secure to himself the privileges granted by patent.

Even private police itself might be the subject of grant. Patents were issued to individuals to seek out infringers and to sue for penalties. In this way there arose a group of inspectors who were in effect paid on a piece-work basis. The grant of monopoly came to be accompanied by a separate patent to enforce the grant. The latter instrument, at the pleasure of the patentee, might be dispensed with. The norms were unsure, the public oversight absent, and favored persons were certain to attempt to enlarge their pecuniary powers. In the medieval commonwealth, to which such a usage was indigeneous, the industrial housekeeping was entrusted to a private police. As older sanctions weakened before the compulsions of the money economy, such a surrender of powers of the state to privileged indi-

¹⁵ The sentiment against monopolies was deep-rooted and traditional. It became articulate in the economy of the town, struggling for existence and often threatened with a shortage of food. Ordinances against regraters, forestallers, and engrossers were still universal and were originally prompted by a sentiment which found expression in the Statute of Monopolies.

¹⁶ See Carr, *Select Charters*, Introduction, pp. 75-78. The dates are 1623 and 1634.

viduals carried a serious threat to the common good. The grant of patent is an expression of public policy, yet enforcement was given over to parties who had ends of their own to serve. To this very day the institution bears the mark of this early abdication of the office of police by the government.

ACROSS THE ATLANTIC

As folk crossed the seas to settle in the New World, they brought with them an established culture. The ideas in their heads, their ways of doing things, their usages of social life all came from abroad. The breaking of ties back home isolated their communities, cut them off from the larger national influences, and sharpened whatever was peculiar in their outlook and beliefs. Their scheme of use and wont had to be accommodated to a new environment, and in the process novelty obtruded and custom was remade. From what England had to offer, they took and left; and the invisible imports were transformed in the course of survival.

Bonds remained—as across a great gulf. A number of the Colonies rested upon royal prerogative; a grant of letters patent to proprietor, corporation, or company lay at the very basis of their existence. Such instruments were at once legal, economic, and political. Their generous clauses insured to the recipients their rights, launched industrial enterprises, and made provision for civil government. From the first there was oversight by the Crown; as Parliament domesticated the monarchy, it asserted its authority; there was always the threat of general orders from abroad. From the beginning there was an intellectual bridge across which the norms of the common law were destined to pass. And the patent is among the most ancient of our institutions.

There was, however, far too little conscious concern with invention for it to enjoy a certain legal status. Nor in 13 separate colonies, linked more closely to a government over-seas than to each other, could there be uniformity. In spite of a variety of grants under which the local authorities operated, the common law was in name rather generally in force. But the common law, whose norm was the judgment of a reasonable man, spoke a somewhat different language in the shires of England, and it was in force over-seas only so far as was applicable. The place of the statutes of the realm was less certain. The orthodox view, as expressed by Blackstone, was that the American plantations were "subject to the control of the Parliament," though not bound by its acts "unless particularly named." But such a sentence makes a complicated matter over simple. A new country cannot at once improvise a legal system; as cases arise, they are referred to authority; and the scanty corpus which emerged from colonial legislatures had to be supplemented. No line is to be drawn between the common and the statutory law; acts are often no more than an official gloss upon the text of the common law.¹⁷

¹⁷ At the beginning of the eighteenth century "An American" in "An Essay on the Government of the English Plantations" voiced his complaint that "no man can tell what is law and what not in the plantations. Some hold that the law of England is chiefly to be respected, and, when that is deficient, the laws of the several colonies are to take place. Others are of the opinion that the laws of the Colonies are to take, the first place and the laws of England are in force only where they are silent. Others there are who contend for the laws of the Colonies, in conjunction with those that were in force in England at the first settlement of the colony, and lay down that as the measure of our obedience,

In respect to letters-patent for the promotion of invention the law is not reduced to explicit words. A man's right to his trade enjoyed, or at least came to be clothed with, the sanctity of the common law. The Statute of Monopolies was technically a rule of pleading. The person accused of restraint of trade was to be tried by the rule of the common law; and, certain exceptions aside, was not to be permitted to advance a grant from the Crown in his own defense. The limited right to the artisan who brings in a new trade is a legislative amendment of the common law. It is easy enough to argue that in the Colonies the law was as it was laid down in the famous chapter in 21 Jacobus 1; but a clear-cut corroboration is lacking in the documents of the period. The reason doubtless is that as yet few inventions were of such a character as to invite legal protection. The rule of law does not receive definitive statement until an occasion calls it into being.

The New World, in fact, placed its own accent upon the norms of the law. The rights of Englishmen were not forgotten by those who forsook the narrow isle for the broad continent. Courtiers who fattened upon the cream of monopoly were not uninterested in the plantations overseas; but for the most part they waited at home for the profits. The privileged came, and in the tidewater of Virginia, Maryland, and New York carved out manors which they worked with slaves and indentured servants. But their numbers were not large and new country was not an ideal soil for their institutions. The disinherited, the persecuted, the restless, played a heroic role in the settlement; but the great mass of migrants were poor people, men without status, who had experienced at first hand the lash of a caste system. They came with the vision of a government which was a commonwealth and of an economy in which there was personal opportunity.

A prerogative which was the "chiefest gem in the royal diadem" lost caste as it crossed the ocean. Not that privilege was accorded no foothold in the New World, where from colony to colony conditions varied. A governor appointed by the Crown was fully mindful of his authority as King's vicar. His power to issue letters which carried special perquisites was weakened by its transport across the ocean, but could not be abated. Along Tidewater, the Hudson, and the James, plantations were maintained by men who were not their own masters. Servant was bound to master, even in the back country, by various forms of indenture; and here and there, where land was rich and owners could be careless in its culture, appeared outright slavery. The crafts, too, established in the towns, exercised such a discipline over their members as a more mobile society would allow. Where a colony was "self-governing," or the ties to an ultimate control from London were loose, a spirit which much later came to be called "individualistic" was in the ascendency. And always there was up-country, over-the-mountains, the great valleys of the West, to put in jeopardy any establishment created in an old-world image.

alleging that we are not bound to observe any late acts of Parliament in England except such only where the reason of the law is the same here that it is in England."—Quoted by St. George Leakin Sioussat, in an article on "The Theory of the Extension of English Statutes to the Plantations," in *Select Essays in Anglo-American Legal History* (—). In this article Sioussat traces the various opinions on the matter with particular attention to Maryland but with references to other Colonies.

Almost from the beginning, New England had the name of rebellious; in Virginia, the rigid social structure of Tidewater had to make its truce with the less respectful ways of the back country. A disposition to tame letters patent to a public office, or to have none of it, was speedily manifest. In 1641, the General Court of Massachusetts decreed that there "should be no monopolies but of such inventions as are profitable to the country and that for a short time only." The statement is clear-cut; it appears as an item in a *Body of Liberties* which proclaim the rights of men to be secure in their lives, liberties and estates. Unlike the Statute of Monopolies 18 years earlier, it sets down no exception, proviso, or saving clause. Its words stand against interests which might in the years to come seek to become vested.

Such a declaration means what it is made to mean. The general assembly did not abstain from grants, but in their issue was rather scrupulous not to barter away any "common right" except for value received. An early patent on an "engine for the more speedy cutting of grass," sets forth in explicit terms the general policy which prompts the award. The instrument is an "answer to petition of Joseph Jenks." He asks "for liberty to make experience of his abilities and inventions" to the good end "that things may be afforded cheaper than formerly." He prays for "14 years without disturbance from any others setting up the like inventions; so that his study in cost may not be in vain or lost." The prayer is granted, but with the condition that "power is still left to restrain the exportation of such manufactures, and to moderate the price thereof if occasion so requires." In a word, the right conferred was subject to the general law, and power was reserved to forbid an unreasonable price and to accommodate the privilege to conditions which could not be foreseen.

On occasion, when the Colonists themselves were tempted to swear away their birthright, a word of warning might come to them from back home. Thus the residents of Albany were admonished by the Dutch East India Co., a concern whose own experience had not been untouched by monopoly. It notes with alarm "that you, if we would ratify it, engaged to favor sundry individuals with grants." It enumerates this list, namely "one for erecting a potash work, one for making tiles and brick, and the third for saltworks." These favors, it "not only entirely disapproves," but requires "that you will not give one single grant more hereafter, as it is in our opinion a very pernicious management." It finds the practice particularly reprehensible in a new state, "whose population and welfare cannot be promoted but as through general benefits in which every one who might be inclined to settle in such a country either as merchant or mechanic may participate."¹⁸

In colonial days the grant is shaped to the end it serves; little that is absolute, inalienable, indefeasible attaches to the patent; its forfeiture is to follow the breach of a condition. Thus South Carolina required the patentee of pumping machinery to build for all applicants alike and to maintain reasonable prices. Connecticut granted a monopoly in domestic molasses, but provided that it must be as cheap and as palatable as the West Indies product. Massachusetts

¹⁸ Munsell, *Annals of Albany*, (2d ed.), p. 78.

granted privileges to a manufacturer of candles who in return agreed to teach his mystery to five apprentices, two of whom were to be nominees of the General Court. Pennsylvania required the patentee to publish a recipe so that others might practice his invention at the expiration of his grant—thus anticipating the provisions for disclosure in the current law.

As evidence of policy all colonial patents have significance. But only in the exceptional instance are they concerned with discovery of useful knowledge. The privilege of erecting a grist mill on the banks of the Connecticut, or a lime kiln on the Delaware lowland, or an iron works in Virginia is a franchise¹⁹ of narrow range. When its product must be sold on the local market, the town sawmill is a public utility.²⁰ It must be regulated, by public pressure if possible, by lawful authority if need be; such was unquestioned doctrine as late as the turn into the nineteenth century. It must, at least for a time, have protection, for in a pioneer country capital was far too precious to be exposed to the corrosion of competition.²¹ In such an economy the closed opportunity is less the tool of monopoly than the instrument of public purpose. The petitioner comes, hat in hand, quite prepared willingly to give a quid for the quo he seeks. The legal diction of the times knows no "property" in the industrial arts; the records are barren of "a right to do as one will with his own" in respect to inventions. The privilege sought is to make and vend, not to hold or suppress. Mr. Jefferson talked the language of his age when he wrote, "Inventions then cannot, in nature, be a subject of property. Society may give an exclusive right to the profits arising from them, as an encouragement to men to pursue ideas which may produce utilities, but this may or may not be done according to the will and convenience of society, without claim or complaint from anybody."²²

Nor was the lawyer's art quite able to break through the guard of public interest. The corporation, a fictitious person blessed with the acquisitive virtues and immune to the frailties of the flesh, was little in evidence. Its arts were little employed in exploiting a grant, turning its perquisites into absolutes, or endowing its grants with perpetuity. The Boston Water Co.²³ and the Free Society of Traders in Pennsylvania²⁴ were the only corporations chartered in the seventeenth century. Only a few more were added before the Revolution—none for the promotion of manufacture. In an age in which a treatise on this branch of law could be called "Of Corporations, Fraternities, and Guilds," the dominant business unit was still the individual or the partnership; even joint stock companies were far from numerous. For

¹⁹ Such words as "license" and "franchise" are not to be used without the caution that their meaning carries uncertainly from our age to the colonial economy. Note, for instance, that the liberty of a trade is not yet distinguished from the right to exploit an invention.

²⁰ The usage, to serve "the public utility," survived until well past the Civil War. The term, as confined to a concern supplying a municipality with gas, light, water, is a very recent vintage. It would not have been understood in colonial days.

²¹ Here is a very engaging analogue to the patent system. To induce investment, with which to secure for the community a ferry, bridge, salt works, or iron foundry, an exclusive right was granted for a period of years. The instrument might be silent about the term of years, and the recipient claim a permanent monopoly. Such a grant, reasonable enough in the early eighteenth century, outlived somewhat the scarcity of capital which drew it into being. Its permanence was outmoded in the famous case *Charles River Bridge Co. v. Warner Bridge Co.* 11 Peters 420 (1837).

²² But note that the question had been raised, or Mr. Jefferson would not have answered it. A man tends to stretch his privilege as far as it will go and to make it his forever. Hence every privilege aspires to become a right.

²³ 1602.

²⁴ 1682.

the most part, by techniques free to all, local craftsmen made articles for local sale. Business had not yet emerged to make the patent a creature of its usages.

A like question is presented by copyright and in copyright this trend of colonial expression finds its clearest expression. The Fathers were never mute; the struggle with England made them vocal; as the years of the war passed they came increasingly to cherish their rights in their own writings. A committee on "literary property" made its report;²⁵ and in accordance therewith the Continental Congress recommended to the several States that they "secure to the authors or publishers of any new books not hitherto printed" their copyright for "a certain time not less than 14 years"; and, should they survive, to another term of equal length, "under such restrictions as the several States may deem proper."²⁶ All the States, other than Delaware, thereupon conferred upon the authors for a limited time after their initial publication the exclusive right to make and circulate their pamphlets, books, charts, and maps. Since a number were conditioned upon like action by other States, some of them never came into force; others were in terms repealed; the remnant lapsed when, pursuant to the Constitution, the subject passed to the Federal Government. Yet in their ensemble they present the contemporary state of opinion on property in ideas as colonies become States and are welded into a republic.

Almost universally they reflect the instrumental character of the grant. The purpose, as expressed in preamble, is to promote literature, or for the encouragement of literature and genius. That copyright should subsist therein, a work must possess intrinsic literary merit.²⁷ They provide for registration and give a remedy at law for trespass upon the owner's preserves. A number, in specific terms, restrict the privileges which are conferred. Five of the twelve States²⁸ required the author to furnish an adequate supply at a reasonable price. If he failed to do so, an action could be brought against him and the right to print be awarded, upon conditions which protected the public interest, to another party. To the Legislature of New York an adequate supply of "useful books at reasonable prices" was "necessary for the encouragement of learning."

²⁵ It consisted of a Mr. Williamson, a Mr. Izard, and a Mr. Madison.

²⁶ Copyright Enactments of the United States, 1783-1906. Compiled by Thervald Solberg. Copyright Office Bulletin No. 3 (1906).

²⁷ See the early statutes of New York, Connecticut, North Carolina, and the Commonwealth of Pennsylvania.

²⁸ The States were Connecticut, New York, North Carolina, South Carolina, Georgia. A provision from the New York statute is typical and deserves quotation: "And, whereas it is equally necessary for the encouragement of learning, that the inhabitants of this State be furnished with useful books at reasonable prices:

"Be it further enacted by the authority aforesaid, That whenever any such author or proprietor of such book or pamphlet shall neglect to furnish the public with sufficient editions thereof, or shall sell the same at a price unreasonable and beyond what may be adjudged a sufficient compensation for his or her labour, time, expenses, and risque of sale, any one of the judges of the supreme court of judicature of this State, on complaint made thereof to him in writing, is hereby authorized and empowered to enquire into the justice of the said complaint, and if the same be found true, to take sufficient recognizance and security of such author or proprietor, conditioned that he or she shall, within such reasonable time as the court shall direct, publish and offer for sale in this State, a sufficient number of copies of such book or pamphlet, at such reasonable price as the said court shall on due consideration affix, and if such author or proprietor shall neglect or refuse to give such security as aforesaid, the said court are hereby authorized and empowered to give such complainant a full and ample licence to re-print and publish such book or pamphlet in such numbers and for such terms as the said court shall judge just and reasonable: *Provided,* Such complainant shall give sufficient security before the said court to afford such re-printed edition at such reasonable price as the said court shall thereto affix."—Copyright Enactments of the United States, 1783-1906. Compiled by Thervald Solberg. Copyright Office Bulletin No. 3 (1906), p. 30.

AND INTO THE CONSTITUTION

In such a climate the power to promote the progress of science and the useful arts was entrusted by the people to Congress. The words slipped into the Constitution without struggle. The clause prompted no formal debate; no fiery pamphlet, no heated attack or fervid defense, no compromise between rival proposals provided a fanfare to its entrance. In contrast to the deliberation which attended the acceptance of many other provisions, the silence of Congress is eloquent. Was it regarded as of no significance? Did a small coterie want it and was the mass of delegates too indifferent to stop it. Was the grant a mere continuation of colonial practice so generally accepted as to be taken for granted? Was it an assertion, against privilege to be rested only upon charter, of fundamental rights inherited from England and written in larger letters by the separation? Above all how deliberate was the statement of policy which its words express?

Such questions cannot be given definitive answers from the reports of the proceedings. We must content ourselves with such light as correlative evidence throws on the event. The language of the clause itself is just such as would be written by delegates familiar with the history of letters patent. The struggle of Parliament against the Crown was familiar to the leaders of national life. The Revolution had begun as a struggle against an arbitrary monarchy. When it had gone so far that "a decent regard for the opinion of mankind" made a public statement necessary, the Declaration of Independence was shrewdly directed—not against obnoxious acts of Parliament—but against irresponsible manifestations of the royal prerogative. The eloquent middle section, in which it gets down to the concrete, is a list of counts against the English Crown. The dialectical stage play which serves as accompaniment to military events followed the drama of more than a century earlier in England; patriots, like Patrick Henry and Samuel Adams, visualized themselves in the roles of Pym and Hampden. The theme of the struggle was the assertion of rights to life, to liberty, and to estate over an authority which pretended to be absolute. A tyrannical monarchy once more was being domesticated into a constitutional government.

A generation whom arms had made American could not quickly forget the ideology of the conflict. It may be that those who came together into the convention were more conservative than the men who met in the same city as the Continental Congress. But they were for the most part young men; their average age was 43, and a number conspicuous in the deliberations, such as Hamilton and Madison, were still in their thirties. Their formative years had been spent during the Revolution touched off by an arbitrary rule. A protest against letters-patent was a part of their tradition; the fight against the Stuarts and their monopolies was still green in their memories. It had provoked the political philosophy which they possessed; quite a number at Philadelphia were followers of John Locke; one of their number had attended the lectures of Adam Smith. In general they represented the commercial interest, stung by the restrictions imposed by 13 upstart States, and determined to clear all obstacles from the arteries of trade.²⁹

²⁹ For descriptions of the personnel and interests of the members, see Charles A. Beard, *An Economic Interpretation of the Constitution of the United States* (1935). For an account of their economic ideas see Hamilton and Adair, *The Power to Govern*, pp. 33-41, 64-78 (1937).

Nor were the members unacquainted with colonial practice. In 1784 the State of South Carolina had passed "An Act for the Encouragement of Arts and Sciences." The statute gave to authors for a limited time the "sole right and liberty of printing" their books, and to inventors "a like exclusive privilege of making and vending their machines." But if the supply was inadequate, or the price "unreasonable and beyond what may be adjudged as sufficient compensation" for the "labor, time, expenses, and risk of sale," the court of common pleas was to demand a correction of the situation. If its order was ignored, it became the court's duty to grant to any complainant "a full and ample license" to print or to manufacture the article in question.

In the Convention, on August 18, 1787, Charley Pinckney, of South Carolina, rose to propose that the Congress-to-be have the power "to grant patents for useful inventions" and "to secure to Authors exclusive rights for a certain time." The same day James Madison suggested authority "to secure to literary authors their copyright for a certain time" and "to encourage by premiums and provisions the advancement of useful knowledge and discoveries." These and similar proposals were sent to committee; and on September 5, the "committee on postponed matters" reported back the provision: "To promote the Progress of Science and the Useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." The report was agreed to "nem. con."—that is, unanimously,³⁰ and in that form it stands in the Constitution today.

The power was granted; the conditions of its exercise laid down. The new republic was conscious of its need for arts and invention. There was, however, no unanimity as to the form which "the exclusive right" of the inventor should take. In his famous Report to Congress, Alexander Hamilton set down "the encouragement of new inventions" as "among the most useful and unexceptional of the aids which can be given to manufactures" and proposed "the propriety of stimulating by rewards the invention and introduction of useful improvements." The bonus system seemed best able to harness together the inventor's reward and the general interest; its great difficulty lay in administration. In so delicate a matter "general rules" will not do; "the dispensation of these rewards" must be put "under some proper discretionary direction." Only thus could "specific compensations for discoveries of unknown and disproportionate utility" be avoided. A little later his associate Tench Coxe wrote at length "On Invention and Encouragement of Industry." His thought still ran in terms of securing new techniques from abroad, as well as from indigenous "merit and genius." So he proposes "premiums for useful inventions and improvements, whether foreign or American." He argues that "the best experiments in any unknown matter, and for the largest quantity of a valuable raw material must have an excellent effect." He suggests that "the state might with great convenience enable an enlightened society, established for the purpose, to offer liberal rewards in land for a number of objects of this nature." He would even have "a committee of this society visit every ship arriving from

³⁰ The expression is *nemo contra*, no one to the contrary.

a foreign country" in order to "inquire what persons they may have on board capable of constructing useful machines."³¹

Thus, as late as the middle of the 1790's, the patent against the premium system was not yet a closed question. Letters patent had been thoroughly discredited in the great movements by which the monarchy was curbed, men were secured in their rights, and colonies became separate states. Its use, even for so limited and so public a purpose, carried its hazards; it might break its bondage to the commonwealth and become a sanction for privilege. But the purchase of the inventor's rights and the immediate release of device or process to all who could make use of it was likewise open to attack. It was not possible to tell in advance what arts would prove useful or how useful they would prove. The premium system threatened to be prodigal with public funds; the patent system threw all risks upon those who asked for favors. It was not the command of the Constitution, but sheer expediency, which dictated the eventual choice.

There was call for action; and, as so often happens, the choice was made long before the battle of words had reached a decision. In a speech to Congress on January 8, 1790, George Washington, who had presided over the Convention, urged: "I cannot forbear intimating to you the expediency of giving effectual encouragement, as well to the introduction of new and useful inventions from abroad, as to the exertions of skill and genius in producing them at home." In response to this suggestion—and to the pressure of inventors seeking private bills of monopoly—Congress passed the first patent statute. The Secretary of State, the Secretary of War, and the Attorney General³² were authorized to grant letters for "sufficiently useful and important inventions."³³ The Congress delegated its power to a trio of high ranking officials and set down the adverb "sufficiently" as a bolster to the restraint with which they were expected to issue grants.

Among the three, Thomas Jefferson, himself a contriver of some repute, took the lead. He was scrupulous in holding applicants to a high degree of ingenuity and few "letters" issued. In 1790 only 3 were granted; in 1791, 33; in 1792, 11; in 1793, 20. Still he regarded the act as serving its function. In his first year as a patent official, Jefferson wrote Benjamin Vaughan, "An act of Congress authorizing the issuing of patents for new discoveries has given a spring to invention beyond my conception." He found many of them to be "trifling"; but "there are some of great consequence."³⁴

But the gadgeteers, anxious to secure their privileges, were dissatisfied with the close supervision of Mr. Jefferson. By 1793 they were strong enough to secure a revision of the original statute. Simple registration was substituted for examination, and discretion faded

³¹ As yet the papers of Tench Coxe have not been made available to students; it is possible that they may throw light upon the acceptance of the Constitutional provision and the passage of the first patent act. Coxe was a kind of a brain-truster to the Constitutional Convention, an associate of Alexander Hamilton in drafting the Report on Manufacturers, and a confidant of men of importance in the shaping of the policies of the new republic.

³² At the time the officials were Thomas Jefferson, Henry Knox, and Edmund Randolph, respectively.

³³ At the time it was not accepted doctrine that the power of Congress put the matter beyond the authority of the several States. For many years the latter continued to act by giving exclusive rights to trades, granting letters patent, and purchasing inventions outright. Usage, rather than a formal judgment, gradually left the Federal Government unchallenged.

³⁴ Jefferson, Works (Liscomb ed.) vol. VIII 50.

into a ministerial duty. Jefferson was vigorously opposed to the degradation of instrument into a ceremonial under which any gimcrack could masquerade as a genuine invention. Nor could he approve a procedure by which a number of familiar devices might be strung together into an "invention," or that sanctifying name be given to an old machine put to a new use. In indignation he protested the drift of the instrument from its constitutional objective: "I might build a stable, bring into it a cutting-knife to chop straw, a hand-mill to grind the grain, a curry-comb and brush to clean the horses, and by a patent exclude anyone for evermore using these things without paying me."³⁵

The words attest a violent reaction by "the friend of invention." The act of Congress, which made a person the judge of his own invention, attests clearly the character of the first period of national growth. It reflects an urge toward expansion, an exuberance in industrial adventure, a spirit of every one for himself that sent men forth to possess a continent. But it could no more succeed than a land policy in which every man was allowed to write his own title to real estate. The common domain in the industrial arts would be gone; the entrance to every trade would be blocked by an array of competing toll gates; the right to earn a living would be by leave of a host of hostile patentees. Its very liberality was the statute's undoing. Every device and contrivance could be affected with novelty; but since there was far more than enough of such low-class ingenuity to go around, there were multiple claims to every invention. Discipline was not the dominant virtue of pioneer America; and privilege grew too rankly to be accorded an uncompromised respect. It was the refusal to accept grants at face value which prevented the courts from breaking down under crowded calendars of competing claims and the rising economy from being strangled in a net work of litigation.

The registration method served the cause of disorder and by 1836 its bankruptcy was obvious. In that year a committee of the Senate discovered that the system had created a flood of void grants, oppression of the public, a plague of lawsuits, and a widespread contagion of fraud. It found that the institution had fallen into general disrepute; discovered a wild abandon in the issue of grants; set it down as "a necessary consequence that" even for new and meritorious inventions, "patents are so much depreciated" as to be of "but little value to the patentee." It concluded that "the object of the patent laws, that of promoting the arts by encouragement, is in a great measure defeated." As a result of the investigation the law was revised and examination restored.

Since that date the history of the patent system has been a series of variations on a common theme. The refinement of procedure, the accommodation of the statute to the growing perplexities of industry, the establishment of a patent office, the development of a tradition, the creation of a special caste of examiners and attorneys—these have been the hallmarks of a century's development. The Patent Office has expanded like a mushroom; the institution has insinuated itself into the pattern of industry; the applications and the grants, the documents which attend and the records through which they are litigated would

³⁵ *Ibid.*, vol. XIII, 380

fill a sizable library. The disputes touched off have cut a wide trail through the annals of the law.

There have been paeons of honor—and an anvil chorus of dispraise—to the usages of the system. Yet by the Congress which shaped an institution to serve a general end, no inventory has been undertaken, no balance sheet struck. For better or for worse, the patent as the means for promoting the industrial arts has had a role of consequence in the concentration of wealth. After a century and a half, its boundaries need to be determined; its experience, recited; its operation, appraised. It is high time that an overall survey be made of an almost uncharted area of public policy.

CHAPTER III

THE AGES OF LETTERS-PATENT

CULTURE SHARES THE INVENTION

A patent is not to an invention as stimulus to response. The creative urge runs deep; a variety of incentives, ranging from idle curiosity through pecuniary reward to the necessity of survival, play upon it; the conditions of society groove the channels through which it seeks outlet. The talents locked up in the chromosome are a bundle of possibilities; it requires impinging circumstances to give to a distinctive capacity its chance or to decree its atrophy. If for milleniums progress was almost static, it was not because the human mind in those far-off times lacked the quality for the drive ahead which it manifests today. A native gift for finance lies sterile among backward peoples, an ability to create a vast edifice of dialectic cannot flourish in the twentieth century as it did in the Middle Ages. An ability to invent is indigenous to humanity and no affair of time and place; but it requires a favorable soil for growth. And culture must prod with occasion, supply the matrix of knowledge, and appoint directions to its activities.

The first flush of American invention owed little to the patent. The transfer of an established culture to a primitive land brought its problems; and ingenuity in meeting them was the price of survival. In the towns—such as they were—artisans might ply their crafts much as in the old country. But, with forests to be cleared and land to be possessed, men drifted beyond tidewater, the compulsions of the price system, the mandates of colonial government. In the backwoods, in a miniature economy of self-sufficiency, the family upon the farm produced its own living. Every activity which could be made to minister to human wants fell within its province. Its own native wit had to take the place of going to market. If substitutes could not be contrived for store goods, it had to do without. A man, without anyone's leave, put to use any knack he could think out or pick up.

Since he was jack of them all, he could hardly help carrying over a trick from one trade to another. The arts in which he was learned were much fewer than those he must practice. In operations elementary to a trained craftsman he had to borrow, remember, fill in gaps, resort to trial and error. The need for self-reliance put him on his mettle; when he was stumped he could not look it up in a book or call in the person who was supposed to know; he had to puzzle it out for himself. The result was a sharpening of wit, a passion for tinkering second only to that for horse trading, the contrivance of a multitude of minor inventions. The pioneer picked up whatever the Indians could teach him; and, in importing their techniques into his established ways, he improved upon them. Again and again novelty cor-

rupted the legacy of useful arts; and domestic manufacture produced a host of articles not known over-seas. The art of the Indian fighter, of the woodsman, of the cowboy, indicates how ingenious and refined an indigenous art might become.

But it all had its unique promptings. It was very much concerned with the making of a living and quite apart from the pursuit of gain. A great deal of it was in the day's work. The rewards which it brought were the plaudits of the neighborhood or a brief superiority in the practice of a calling. But the pioneer mind did not easily entertain the idea of private claims in the useful knacks; novelties were not called into being by any hope of an exclusive right; they were rarely blessed by a patent which was to be had only by a journey to the capital of the colony and a venture into a terrifying ceremonial of "making out papers." Often their use was severely local and never in such a world could they have been policed. The mind of the farmer did not always separate the invention from the craft in which it was incorporated. It required its detachment and an appreciation of its identity to bring it into general use. The "innate propensity" to contrive and project is doubtless as strong as that "to truck and barter." The conquest of the wilderness drew it out but put it to no business use.

Much the same thing goes, on a miniature scale, for industry. Conditions did not favor colonial manufacture, and Great Britain did not point its policy to the encouragement of rival workshops across the seas. The crafts had been brought over; and in the towns the cobbler, the weaver, the smith plied their common—or commercial—callings. The artisan fashioned materials into custom-made articles; when he was busy upon orders he produced ready-made goods for sale. In time some trades outgrew their domestic habitats and their products came to be widely known. The shoes of Lynn, cloth of Providence, stockings knit in Germantown, tinware of Berlin in Connecticut were all famous "market-goods." Likewise a number of arts had become detached from the domestic scenery and were already industries in embryo. In cities like Philadelphia, Wilmington, and Baltimore, there were "commercial" flour mills; around Cape Fear and along the Mohawk River, commercial sawmills; and in New Jersey, Pennsylvania, and Virginia, commercial furnaces wherein iron was wrought. But mercantilism had its set pattern; within its stricture the Colonies were to remain plantations, not to become rival workshops. Commerce was a mere fringe to an agrarian economy. But, within its restricted area, Yankee ingenuity wrought its variations upon borrowed techniques. It had to improvise for sheer lack of knowledge; it had to invent to be able to carry on. But there was little separation of the art from the trade, and a treatise upon property in technology could not have been written for want of instances.

The Revolution gave a strong impetus to technical progress. Munitions could not all be imported from France and Spain; they had to be produced at home and in quantity. The economy had, in a crude sort of way, to be geared to manufacture; and, even in the eighteenth century, "war supplies" made up a rather formidable catalog. The Continental Congress authorized the formation of local societies, bound together by correspondence, to improve the arts and sciences. Factories established to serve military needs remained as plant capacity when the struggle was over. Where interests have been created,

men are ingenious to find new uses for old capital. A host of workers had been trained; a body of useful knowledge had been accumulated; the conflict itself had created resources for a modest venture into industry.

The stimulus of war carried into the period which followed. An outcome of military interest was a Society for Establishing Useful Manufacturers, whose sponsors were Alexander Hamilton and Tench Coxe. It was to be financed by federal, state, and local bodies and to include upon its governing board representatives of the public. To the new nation elaborate projects became indigenous; a host of ventures, which inflamed the imagination and promised to fill the pocket-book, competed for the custom of investors. Grants, bounties, public lotteries, "Buy American" campaigns created a climate of belief in which such schemes found easy going. The rupture of the English mercantile economy caused men to look nearer home for manufactured goods. Massachusetts offered to a company established for the manufacture of glass a monopoly, an immunity to taxation, and a promise that its employees should be exempt from military service. Ezra Stiles, the forward-looking president of Yale College, offered free mulberry seeds to the ministers of Connecticut. Neither the glass nor the mulberry venture was successful; but faith was strong and not easily quenched by failure.¹

The urge for promotion found vent in many channels. Companies were organized for banking, insurance, turnpikes, water supply, toll bridges, and inland navigation. Such ventures served a current need and met with success.² For the time manufacture had no such easy going. The mass of the people were little addicted to commerce; ready-made wares had to force their way into a pioneer design for living; it took a larger market than was to be had to sustain an enterprise. The very conditions which stimulated ingenuity helped to retard manufacturing, for the bulk of the people who lived on farms had little ready cash and were clever enough to fashion hand-work to their needs. Yet the very multiplicity of projects, the propaganda by Hamilton and Coxe, the attempts of legislatures to fan the sparks testify to a national impulse not easily to be stopped.

A ceaseless effort sought to remove obstacles and prod ventures along. If free enterprise fell short, the favors of the Government were sought. Indeed, there was fear "that some foolish and wanton assembly may parcel out the Commonwealth into little aristocracies"; and many good people deplored the influence of "large associations of overgrown moneyed importance and ambition." Perhaps the missing factor was capital—although Americans already had a name for being prone to rash pecuniary adventure. Labor was alike a deterrent and a stimulus. It was not skilled; it was willing to accept low wages; it had, through an English culture, been disciplined to a passive role in a mercantile state. But the frontier, with its opportunity to be a free

¹ J. S. Davis, *Essays in the Earlier History of American Corporations*, vol. II, p. 269 (1917).

² Gen. George Washington, after visiting the Boston Sail Cloth Manufacture, wrote in his diary: "appeared to be carrying on with spirit, and is in a prosperous way * * *. They have 28 looms, and 14 Girls spinning with Both hands (the flax being fastened to their waste). Children (girls) turn the wheels for them, and with this assistance can turn out 14 lbs. of Thread pr. day when they stick to it, but as they are pd. by the piece, for work they do, there is no other restraint upon them but to come at 8 o'clock in the morning and return at 6 in the evening. They are the daughters of decayed families, and are girls of Character—none others are admitted * * *. This is a work of public utility and private advantage." Davis, *ibid.*, vol. II, p. 261 (1917).

man, presented temptation; and its very scarcity drew employers to seek ways to make the available man-power go as far as possible.

Even smuggling did its part to dull the edge of invention. Along a loosely guarded coast-line, the activity of "the gentlemen" had full opportunity to counter native effort with foreign goods. And patriots, whose feelings had been aroused by the recent struggle, were not above charging the British with sabotage. But the dominant handicap must have been the domestic state of trade. A backwoods standard of life, a want of the wherewithal with which to purchase, and skill to fashion for one's self meant that the essential lack was an adequate market. But the urge to tinker and discover was there; insistently it sought expression.

In this situation the separation from England became a prelude to opportunity. In the old country the useful arts were going through a transformation which many decades later was to be called "the industrial revolution." The word rubber suggested to Priestly—a friend of Mr. Jefferson who had brought from over-seas a head full of scientific, democratical, and deistic notions—an article for "wiping from paper the marks of a black lead pencil." Engine, as popular usage had it, was still a word at large; it was an implement or tool, a plot or artifice, an instance or product of ingenuity. The engines of war were familiar, somewhat better known than "the dark engines of policy." Machine, to the denizens of the times, was a structure, a vehicle, an instrument of complicated parts; in mechanics the well-known examples were the lever, the pulley, the wedge, the screw, the inclined plane, the axis and wheel; "the mind casts its eye over the whole machine of society." Yet mechanics was on the march; the steam engine was becoming a source of power; the machine process was well on its way. America demanded factories; English workshops possessed the technology with which to make them go.

Access would have been easy—if current practice had accorded with the law. In effect the Statute of Monopolies imposed upon the owner of the patent an obligation to train two sets of apprentices. Since his privilege ceased as soon as this duty was discharged, the effect was to remove all legal bans upon the use of the invention. But mystery did not cease with the passing of the gild and parliamentary intent could not survive the rise of the division of labor. There was no longer a trade which in its integrity could be passed on from workman to workman; there were only devices, instruments, processes, more or less severable from the work of the artisan. The inventor did not have to take out a patent; he might, if he preferred and if he could, keep his innovation a trade secret. Even if he accepted a grant, he might escape disclosure; it was a long time before the legislature recognized that apprenticeship no longer performed its office and decreed publicity. An "enticing away" of workmen became a common means of acquiring useful arts. Its possessors employed the division of labor as a defense and attempted to confine the knowledge of a single workman to a fragment of the whole process. Espionage, quite legal if successful, became established usage.

The separation from the mother country became an invitation to America to help itself. No decrees of a mercantile economy were any longer strictures on domestic manufacture. The techniques developed in Great Britain remained mysteries only so long as they were closely guarded. Americans at home did not show an exaggerated respect

for the property of Tories, and rights in such intangibles as trade secrets were far from sacred. It was an open season and, patent or no patent, citizens of the United States regarded themselves as free to take what could not be nailed down. The great deterrent was the difficulty inherent in the transmission of technical intelligence. As yet the blueprint had not become a universal language; societies for the mutual exchange of useful knowledge were in their infancy; there was a dearth of trade papers and volumes of proceedings. English inventors, or their assignees, in instances at least, would doubtless have been glad to license Americans to manufacture; but the practice had in the Colonies been little in vogue and to the emerging national mind royalties to the erstwhile enemy was suggestive of tribute.

It was easy to start a factory; the difficulty lay in gaining possession of the useful knowledge with which to carry on. The technical literature which came over the waters was meager. One who had visited the works could hardly carry away an exact description in his head; even a campaign of espionage, artfully planned and shrewdly executed, was likely to reveal far less than there was need to know. An ex-worker from an English shop who chanced along was a godsend; he might supply missing pieces to the technical puzzle; he was a rare bird if his head held the whole of any technology.³ Chance fragments of knowledge, a bit of hearsay, a general impression was checked against "the way it ought to go." In instances articles from abroad were carefully studied to determine how they were made; as occasion demanded, arts or their elements, were smuggled in. As yet there was little of a technical tradition here; only in the exceptional instance did the domestic inventor chance upon something that was startlingly novel. But, if in reducing to precision a method about which he was not fully informed, the native turned up little that was original, his talents were constantly upon the alert. It was a period of empiricism; a continuous process of repeated trial and corrected error whose objective was the reconstruction of arts established elsewhere. Enough that design or technique was new to the man who stumbled on it and that his activity was creative. An urge toward finding out went along with a lack of respect for equities in the discovery. But the period provided a grand school for inventors.

A NUMBER OF BEGINNINGS

A conjunction of elements touched off discovery. Its spirit is indigenuous to the conquest of the continent. Its early habitat is an agrarian culture. Its stuff of idea and process is a series of imports from the Old World. The occasion, which detached novelties from their trades and lifted them to importance in their own right, was the growth of manufacture. Science cannot escape its environment; men of talent cannot reach into another intellectual world to capture elements which are not there. Within such a frame a medley of trends has usurped

³ The England which originated the patent device as inducement for the importation of new technologies placed rigid restrictions upon the direction of their growth. By parliamentary edict no worker in the textile trades was permitted to emigrate from the mother country. It was only by stealth and without benefit of blueprint that the seed of English technology was transported to the fallow American soil. Samuel Slater, who by virtue of severance of family ties was freed from maternal obligation, undertook apprenticeship in the partnership of Strutt and Arkwright, determined on a future in the New World, committed to memory the advanced designs of Arkwright, Hargreaves, and Crompton, and in 1789, aged 21, departed the mother country in disguise for the United States. Under his guidance the first textile factory was built from the crude materials of American handicraft and artisanry and commenced operation in 1793 in Pawtucket, R. I.

the dual role of cause and effect in the creation of technology. The isolated farm stimulated ingenuity rather than invention; the advent of manufacture was an invitation to tinker; the occasional need for munitions was a prod to which even sluggish intellect responded. This economic trio, to an accompaniment written by a variety of minor factors, hastened or stayed the progress of the useful arts. In their varied impulses they made areas favorable or adverse to the urge toward innovation.

Where culture was agrarian, the urge found outlet rather in revising crafts than in contriving mechanisms. The vast stretches of virgin lands, the pioneer outlook on the world, the self-sufficiency of the economy, the absence of technical exposure, all kept the farmer from going to science for ideas and leads. Into his world of hay and wheat, of indigo and tobacco, of quilting bees and barn raisings, the ways of commerce came slowly. The farmer knew the windmill, the spinning wheel, the rotary motion of the upper and nether millstone. But refinement towered above invention; novelty did not stray far from manual dexterity; and the unspecialized activity of the farmer did not turn deftly to model and design. A cleverness of wit and hand left its products; but inventive gifts were not yet regimented toward service to a machine process.

Along the commercial fringe of an agrarian economy, the climate was more inviting. Away from the highways of trade the man who forsook thrift and industry to waste time and substance was looked upon as queer. But in the neophyte industrial centers of the East, where a quickening touch came from overseas, a search for novelty in instrument and method was accounted good business. Here the influence of the farm could not be escaped. Town folk who had left the country could not escape the rural culture of their upbringing. It held in leash the impulse to contrive strange mechanisms and to transform handicrafts to sequences of repetitive motions. But impetus, too, came from back country; for ingenuity found expression in the establishment of rude hand factories to absorb, process, and turn to profit the surplus of farm products. And in agriculture, and the communities which it supported, was the great American demand for any gadget, machine, or contraption which could turn hard labor into easy work. The farm imposed its leisurely tempo upon the farm-bred inventor whose incentive was to exploit the farm market.

The thinnest edge separated reconstruction from invention. As an instance, conspicuous in itself yet evidence of how gradually the line was crossed, witness the rise of farm implements. Agriculture was the American economy; yet until 1800 its operations were carried on by hand, with the assistance of the rude creations of the local smith and the neighborhood carpenter. In the first census a single manufactory of agricultural implements is mentioned, a concern whose annual output reached a figure just short of \$2,000. Even by 1820 hardly a score of such establishments had come into being; their principal products were such rudimentary machines as axes, hoes, rakes, shovels, and scythes. Shape and quality might be on the mend, but in kind and name they were all known centuries before.

Yet, even before the dawn of the new republic, improvement was on the way. In 1797, for an improved plow of cast-iron, the first important agrarian patent was granted to Charles Newbold. Against the firm conviction of sturdy farmers that iron poisoned the soil, his

privilege to make, vend, and use proved of little value. The second major contribution came from the workshop of Thomas Jefferson. He experimented with the form of the moldboard, accepted Newbold's device, incorporated other novel features, and contrived an improved plow. It was not patented; it had the name of its inventor and a lot of promotion by correspondence behind it; and, by 1830, it had triumphed over the conservatism of country folk.

In 1803 a patent for the cradle, an implemented arm for cutting grain, was granted. Almost at once it began to replace the scythe; increased the efficiency of the worker; pointed the way for other mechanisms. About the same time the fanning-mill, a device for cleaning grain after threshing, was introduced. The scarcity of labor is most acute at harvest; and the two inventions, which were rapidly improved, hastened the extension of farming and speeded the western movement.

But such advances were improvements upon tools; the machine process had to be thrust into agronomy from without. In England a number of machines had been devised for the spinning and weaving of cotton. But manufacture was kept small by the scarcity of raw materials. Spindles and looms might be agile and greedy, but they could not have their real opportunity so long as the lint had to be separated from the fiber by hand. The steps in the productive process taken over by machinery threw into sharp relief the initial manual operation. Cotton was ready to become king, lord it over the plantation, provide slavery with an industrial foundation, give impetus to the youthful textile industry of New England—yet the condition of its reign was the invention of the cotton gin.

The need was less obvious than it seemed. As yet cotton was not one of the staples; the Southern States were not identified with its growth.⁴ It was really a pioneer adventure for Eli Whitney,⁵ a saddlebag schoolmaster from Connecticut, to contrive the original cotton gin. Yet, revolutionary in its effects, it was, as sheer technology goes, no brilliant invention. Its mechanics was simple enough for the ordinary man to understand; and, nothing daunted by a patent from the Federal Government, the farmer folk of Georgia proceeded to erect their own machines. The high prices demanded for the lawful product killed any scruples they may have had over an invasion of private rights in a necessary contrivance. Acts in negligent or wanton disrespect of Whitney's patent occurred faster than they could be quenched by infringement suits. Judges found difficulty in detecting legal harm in imitation and proved rather careless of property rights too incorporeal to be seen. Not until 1807, some 13 years after its grant, was the validity of the patent recognized by a court. The States of Georgia and South Carolina, however, in behalf of their own citizens purchased his rights and paid him \$60,000 therefor. The bulk of this was spent by the inventor and his associates in attempts to protect his claims and to exploit his market. Very little of this expenditure was returned in royalties. Later Whitney anticipated Henry Ford and the assembly line in his most important contribution, the invention of standardized parts and

⁴ The arrival of a small cargo of cotton at Liverpool late in the century caused some perplexity among customs officials. They were sure that there was some mistake in the bill of lading which placed the point of origin in the United States of America.

⁵ For a discussion of the life of Eli Whitney see "Whittling Boy, The Story of Eli Whitney," by Roger Burlingame (1941).

belt-line production. But he had become so disgusted with the operation of the patent system that he refused to put in a claim.⁶

A more spectacular instance is the steamboat. The produce of farm must get to market; and in the new republic waterways were the arteries of trade. The canoe is lacking in capacity for cargo; the raft is suited only to a one way passage; a ship with sails is not at its best on a river. There was need for a craft to which upstream was like down and whose agility in maneuver made bends, however many and sharp, of little account. The elements were all at hand; the boat was a familiar object; steam was well-known; the steam-engine had been in use for more than a century; in the year 1775, James Watt, a neighbor of Adam Smith, has given it efficiency and a future by the invention of a condensing cylinder. The task was to add a bit of tinkering and secure a vehicle of transport which was far more than the sum of its parts.

The need lay obvious on the face of the economy; a number of individuals, rather widely scattered, were tempted to whet their talents upon it. As early as 1783 Oliver Evans, in Wilmington, Del., began experiments in an attempt to apply steam to the propulsion of a boat.⁷ Yet the machine technology was so little advanced and he gained proficiency so slowly that it was not until 20 years later that he could link power to paddle-wheel in a way which even crudely could be said to work. But others were engaged upon the puzzle; and shortly after Evans' first attempts, the State of Pennsylvania accorded to John Fitch "the sole right and advantage of making and employing the steamboat, by him lately invented, for a limited time." Similar grants were acquired from the States of Delaware, New York, and Virginia; but, despite this vantage position, Fitch was forced to abandon his experiments, when his attempts to operate a steamboat on the Delaware River resulted in financial disaster. Likewise in 1787 a craft, devised by James Rumsey and operated by steam chugged weakly up the Potomac at 4 miles per hour. But this boat, like all others developed before the turn of the century, paraded defects in metallurgy, defects in the quality of machinery, defects in engine construction, defects in engineering principles. As with the others, the sum of the deficiencies spelled inadequate performance and financial insolvency.

⁶ The author has been afforded access to an unpublished manuscript by William A. W. Krebs, Jr., entitled, "The Whitney Patents" (1940).

⁷ Evans, one of the most prolific inventors of his time, early succeeded in developing a conveyance system for the handling of grain without use of manual labor. Attempts in the 1780's to introduce his contrivance into the then agricultural States of Pennsylvania, Delaware, and Virginia met hostile reaction from millers interested in maintaining their rights to a livelihood. A Federal patent secured under the act of 1793 was declared invalid by the circuit court of Pennsylvania shortly after it was issued. Subsequently, in 1808, the Congress by a special act entitled "An act for the relief of Oliver Evans" authorized the "issuing to him of a patent" for the "invention, discovery, and improvements in the art of manufacturing flour and of the several machines applicable to that purpose." Numerous instances of alleged infringement, however, robbed him of the benefits of the congressional mandate. In 1815, the Supreme Court, without considering the merits of legislative grant held that use under the invalid patent did not entitle an alleged infringer to continued use subsequent to the 1808 statute. (*Evans v. Jordan*, 9 Cranch 199 (1815).) After prolonged litigation a case testing the validity of the congressional grant finally reached the Supreme Court only to be sent back for a rehearing on the question of prior use and publication. (*Evans v. Eaton*, 3 Wheaton 454 (1818). Mr. Chief Justice Marshall writing the opinion.) Four years later, 3 years after Evans' death, a second case reached the highest court; the Evans' patents were finally declared invalid for lack of specificity. (*Evans v. Eaton*, 7 Wheaton 356 (1822), Mr. Justice Story writing the opinion; *Livington, Johnson, and Duvall, J. J.*, dissenting.) A companion case on a similar issue (*Evans v. Hettich*, 7 Wheaton 453 (1822)) was also decided against the Evans' interests. The general antagonism by the established trade toward the introduction of a novel art and the antipathy of the courts, those both of appellate, and original jurisdiction, to the patent grant, are not atypical reactions to the efforts of early inventors.

It remained for the trio of invention, finance, and politics, in a close accord, to turn the trick. Robert Fulton tinkered with the old contraption, eliminated defects, introduced precisions, made the gears engage. In 1807 the Claremont paddled laboriously but assuredly up the Hudson from New York to Albany. There might be interruptions of service and the vessel was not guaranteed to run on schedule; but at last appeared a vessel which could hold its own against the wagon and the stagecoach and promised to become a profitable business enterprise. The inventor could not go it alone; and to the venture Livingston brought adequate finance and political prestige.

The accord brought pragmatic results. It was, however, the State rather than the Federal Government which proved most helpful; and encouragement took the form of an exclusive right to a trade rather than in an invention.⁸ The State of New York issued to Fulton a monopoly of steamboat navigation upon the Hudson River for a period of 20 years. By this late date there was no longer secrecy about the mechanism; the sums necessary to build and equip fly-by-nights or even palatial steamers were to be had; and only with difficulty could outsiders be restrained from the business. A large part of their gains were spent by Fulton and Livingston in securing to themselves their chartered privileges. A decision of the Court for the Trial of Impeachments and Errors, from the pen of James Kent, fortified their legal position but did not abate the nuisance of competition.⁹ The issue would not down; the law reports were again and again enriched;¹⁰ and it took an appeal to the United States

⁸ Note that there was, in these grants by the several States, no separation between the exclusive right to a trade and the exclusive right to an invention. In applying for protection the inventor kept secret his process and his mechanism. There was no disclosure; instead officials or their representatives were permitted to witness the contraption in operation. Thus a group of gentlemen, who represented the Commonwealth of Virginia, observed Rumsey's steamboat on the Potomac and recommended the grant. See letter from James Madison to Thomas Jefferson, January 9, 1785, describing events in the Virginia Legislature. "Letters and Other Writings of James Madison," Congressional Edition (1865), vol. I, p. 122. Apparently both Fitch and Rumsey obtained grants from Virginia, but neither was able to turn the assistance to practical advantage.

⁹ *Livingston v. Van Ingen* (9 Johnson's Reports (N. Y.), 507 (1812)).

¹⁰ *Livingston v. Van Ingen*, opinion by Chancellor Kent, then chief justice of the New York Court of Impeachments and Errors, held the "five several statutes" of New York State, "passed between the years 1798 and 1811, inclusive, and granting and securing to claimants the sole and exclusive right of using and navigating boats by steam in the waters of (the) state for a term of years, * * * substantial and valid acts." In this first decision, supporting the Fulton-Livingston interests, Kent was forced to consider no explicit conflict with Federal acts; but a subsequent action, grounded on infringement, raised in embryo the State versus Federal issue which was to enslave so much of political thought during the first half of the nineteenth century. In *Ogden v. Gibbons*, 4 Johnson's Chancery Reports 150 (1819), defendants to an action by an assignee of Fulton asserted by way of defense the supremacy of a coastal license granted under the laws of the United States. Both by the chancery court, Kent speaking, and subsequently by the court of errors, 17 Johnson's Reports 488 (1820), it was held that this license merely conferred an American character upon the steamboat for the purpose of revenue; ordained no benefit of property right to the holder thereof; and constituted no defense to the monopolistic franchise granted by the State of New York. Thereafter the issues considered in *Ogden v. Gibbons* maneuvered their way into the national arena to be at first turned out for lack of a final decree from which to appeal, *Gibbons v. Ogden*, 6 Wheaton 418 (1821). At this same time a companion case, *Sullivan et al. v. Fulton Steamboat Company*, 6 Wheaton 450, arising in the Federal courts, was dismissed for failure to allege diversity of citizenship. Three years later the procedural deficiencies eliminated, jurisdiction assumed by the Supreme Court, the memorable opinion of Mr. Chief Justice Marshall reversing the stand taken by Kent was handed down, *Gibbons v. Ogden*, 9 Wheaton 1 (1824). Although Marshall refused to touch "upon the right of the states to grant patents for inventions or improvements, generally," he did extend the implications of the decision beyond the simple question of competing State and Federal statutes. Asserting that "the deep streams which penetrate our country in every direction pass through the interior of almost every state in the Union, and furnish the means of exercising" a control over commerce, Marshall concluded that "the power of the courts * * * must be exercised within the territorial jurisdiction of the several states." For this destruction of a State's exclusive control over its navigable waterways Marshall was criticized by Kent in his famed Commentaries; but whatever the tenor of personal opinion, the Marshall pronouncement marked the end of monopolistic domination of steamboat traffic and the opening of the Hudson-Mohawk waterway to the commerce of the new West. For Kent's views, see, Kent,

Supreme Court to close the chapter. In a celebrated case, Mr. Chief Justice Marshall ruled that, since his vessels were enrolled for the coasting trade under an act of Congress, Gibbons was quite in his right in operating two steamboats between New York City and the Jersey shore. The Federal license was quite untouched by any monopoly of "navigating by fire and steam" issued by a mere State of the Union; hence, the courts could accord no protection to the license which Ogden held from Fulton. The decision was followed by a breakdown of the legal privileges accorded the inventor. The technique of the steamboat became public property; its design and mechanisms were improved. Its art was, quite without the encouragement of the law, pushed rapidly; an era of river navigation ran its course; and before the twenties were gone, steam propulsion had made its way into ocean transport.^{10a}

In manufacture the urge toward invention was conditioned by its opportunity. At the time the first patent act was passed, Oliver Evans had already developed a double-action, high-pressure steam engine and an improved grist mill. And others, like Fitch, Perkins, and Rumsey, had invented gadgets and improvements to standard agricultural implements. If such novelties did not speedily make their way into general use and bring forth others after their kind, it was because an exuberant national development pushed them to one side. Albert Gallatin, writing in 1813, was forced to revise Alexander Hamilton's optimism about the future of manufacture. He attributed its arrested growth to high wages, the abundance of land, the scarcity of capital, and the endurance of agrarian culture habits. So backward was industry that in 1804, 10 years after the introduction of Whitney's gin and 12 years after Samuel Slater had set up his mill at Pawtucket, only four cotton factories were operating in the country. Two years later the dependence of American prosperity upon foreign manufacture was persuasively argued against the embargo.

The origin of the machine process derives from the appropriation—without benefit of any patentee's consent—of the technology of English spinners and weavers. By the time of the Constitutional Convention, the British textile industry was on a machine basis. The Napoleonic wars, by driving barriers between American markets and foreign sources of supply, stimulated domestic manufactures. When George Washington was inducted into the Presidency, only two textile mills were in existence. The census of 1810 records vast strides in total production—half of which is to be attributed to textiles, leather, liquor, iron. Technology had come over in dribblets; in general it was a domestic version of an imported art.

The industry invites the invention: the invention blazes the path for the industry. Each does the task the other gives it to do. In 1814 the invention of the power loom gave impetus to textile manufacture and 2 years later George Dallas, the Secretary of the Treasury, notes its preeminence. The new device, installed by Francis C. Lowell in "the first complete factory in the world," led the way to an era of

Commentaries on American Law (1826), vol. I, Part II; The Jurisprudence of the United States, Lecture XVI, pp. 323-324; Lecture XIX, pp. 405-418. Kent's attitude on the Marshall decision has been more charitably interpreted in a recent book by John Theodore Horton, John Kent, A Study in Conservatism (1939), p. 288.

^{10a} Here, however, steam met the stiffest sort of competition. The clipper ship is a triumph of American craft and invention. Seldom has a work of man been so rapidly and brilliantly advanced. Yet the most romantic of nineteenth century arts went forward, under the stimulus of an intense competition and without the benefit of any patent whatever. See Samuel E. Morrison, Maritime History of Massachusetts.

rudimentary belt-line production. Its introduction brought violent competition into the dry goods market; and Lowell, Lawrence, Fall River, Cohoes, Holyoke, and Paterson each sought to become the great textile center. So easy was admission to the trade, so rapid the increase in demand, that by 1840 more than 1,200 separate factories were processing 126,000,000 pounds of cotton annually. Yet only slowly were primitive ways outmoded. It was the early thirties before the machine outstripped the spinning wheel and the hand loom in volume. Even a decade later less than 10 percent of the factories made use of steam power.

Iron marks a turning point in the history of technology. Unlike textiles, it emerges from the union of many arts. Its establishment marks the industrial coming of age of the new Republic. If textiles were dependent upon agriculture, iron was in bondage to munitions, farm implements, steam-power, the river navigation which enlarged markets, the satellite activities surrounding these major stimuli. An improved quality of iron was demanded by musket manufacture; by the machinery employed in ginning, weaving, and spinning; by the apparatus of steam power in factory and on ship.

Almost at its inception the industry encountered a problem which for a time baffled it. The markets for iron—and for the machines it entered—were in the East; an essential in the smelting of the ore was charred wood; the forge must go to the charcoal or the charcoal must be brought to the forge. As eastern forests disappeared, sources of supply moved farther and farther away. The difficulty of transporting iron products over rude roads or by circuitous river routes prevented a western march of the furnaces. The scarcity of charcoal and the expense of getting it to tidewater raised sharply the cost of manufacture. By the mid-thirties English iron—thanks to a process whereby a hot air blast was driven through bituminous coal—was able to vault tariff barriers and to threaten destruction to the native industry.

At this critical moment two factors conspired to save the domestic market. A dozen years before anthracite had been employed in the generation of steam; now it was successfully introduced into the smelting process, and worries over inadequate supply and low quality were over. At the same time the fugacious spread of the railway made coal of general value, solved the problem of carriage, and multiplied many times over the demand for iron. The advance of manufacture had been arrested by the lack of power-fuel free of serious shortcomings and the absence of an adequate supply of durable iron. As the production of power moved from a coal to a wood basis, the signal to go was given to a whole technology of arts. The steam-blast supplanted the air blast in the smelting process; the by-products of combustion, gaseous excretion, were utilized in the processes of pre-heating. As iron became a superior metal, tools of more durable quality were devised and rough estimate gave way to precision manufacture. As malleable materials were converted into refined mechanisms, the system of efficiency was on its way. By 1850 a major part of the market for rolled iron and iron rails—which by virtue of a superior process belonged to the foreigner—had been reclaimed. The advance of iron culture—which imprisoned a more refined art in a series of machines—was fatal to the less precise and more laborious methods of handicraft. Thus

the newer metallurgy expelled the import, replaced the individual artisan, and created a market they never knew.

Ancient arts became machine processes. Sewing machines, shoe machines, rotary presses were expressions of the technology of the forties—all structurally dependent upon advances in the quality of iron. An off-shoot of iron production was the Naysmith steam hammer, invented in 1842. It brought a mutation into all metal work and changed the methods of mining, dredging, and construction. Edge-tools, dependent upon superior iron, were fitted into planing machines to revolutionize woodworking and furniture making and to bring mass production to the cabinetmaker's art. Fragments of technology were amalgamated into new processes.

Thus a spirit of tinkering, manifest before the Revolution brought economic independence, swung into its stride. For a time the progress of the industrial arts was conservative and orderly, little broken by the appearance of mutations. Although at harvest time labor was proverbially as scarce as hen teeth, decades passed in the life of the Republic before McCormick invented the reaper and, through his innovation, the work of the farmer began its painful shift to a new technical base. Not until 1840 did Goodyear put into play an inquiring mind, a dissatisfaction with the existing article, and a desperate financial plight to give rubber a new definition. His patent emerged from an industrial matrix quite unlike that which had attended the birth of the Nation, yet he died without realizing the significance of what he had done.¹¹ In the twenties science blazed the trails and in the thirties the telegraph followed as an instrument of communication. But it had to bide its time until the railroad created the demand for the rapid transmission of intelligence, safety required the subjection of electrical impulses to practical uses, and the tempo of business made necessary an instantaneous question and answer. No amount of protection could have secured to genius its reward until society was ready and willing to put the invention to work.

In all of this the roles of cause and effect are blurred into a mutual causation. The impulse of the industry is the stimulus which touches off the inventor's response. The inventor's idea, made manifest in process and design, gives to the industry its larger opportunity. In this formative period many are the incentives which quickened the advance of the useful arts—the borrowing from abroad, the reconstruction of processes not fully understood, franchises to trades from the States, the encouragement of letters patent, the necessity of carrying on and of getting ahead, the sheer urge of idle curiosity. As yet science has contrived no instrument of precision by which the contribution of each to the march of technology can be registered.

But, whatever its causal role, the patent is a barometer of what was coming to pass. As industry from a faltering start gained momentum, the number of grants followed its course. In the decade 1790 to 1800 only 306 letters were issued; in the next 11 years more than 1,200 were added. From 1812 to 1817 the annual average had risen to 192. For the single year 1830, the number reached 544. The total for the decade of the forties ran almost to 6,000; and, in 1849, for the first time the

¹¹ His patent, issued in 1837 and numbered 240, was rather comprehensive. His strenuous empiricism had blocked out the rudiments of the modern process of curing, molding, waterproofing, and preserving the commodity. It took more than six decades to discover that his cushion against shock had opened the way for the conquest of speed and had made the modern motorcar possible.

annual vintage topped the 1,000 mark; only for 3 years since then has it fallen below that figure. In the fifties some 23,140 certificates testify to the contagion of invention through the whole economy. The machine process was in the saddle.

INVENTION DOES NOT RIDE ALONE

The nature of the grants reflects a changing economy. It was commerce which prompted the Constitution; yet for the first 20 years of the new republic, industrial patents were largely the off-shoots of work on the farm. Improvements in the plow, water power, the grist mill, the grain conveyor all reflect the rural environment.¹² The Whitney gin, the Lowell power loom, the inventions in textiles generally were devices by which wool and cotton sought wider markets. The demand for the steamboat came from agrarian communities intent upon outlets for their surplus produce; the initial office of the railroad was to link the back country with the tidewater.

Yet number and character signify only within the enveloping culture. It was an era of opportunity—at least for the lucky, the resourceful, the man hardened to everlasting struggle; and many forces invited the progress of the useful arts. There was the expanding country, the transformation of culture, the migration of country youth into business, the conversion of household arts into industries, the simplicity and clumsiness of early machines, the factorization of the handicrafts, the work to be done if only tools adequate to their doing were to be had. As yet the country was little cut up into closed preserves; interests were striving none too successfully to become vested; the map of the economy presented vague contours which refused to be put. The conditions which sustained competition were widespread and its roots ran deep. Restraints were difficult to impose; the patent secured rights in the invention. It had not yet become a legal foundation whereon to rest a body of trade practices.

But even a flexible economy is not immune to stricture. Amid the din of change the ancient device of the corporation was furbished up for new adventures. As a fiction—a person of art by grace of the law—it came into play and was elaborated into an intricate and refined instrument of control. It gave unity to a mass of investments, piled up sums huge enough for large-scale ventures, and imposed a single will and purpose upon a miscellany of materials. It concentrated power, established absentee ownership, and stripped from parties in interest—investors, stockholders, employees—all discretion while it absolved them from responsibility. It supplied a form under which the technical advances of the forties could be capitalized into giant business enterprises. And, by its regimentation of investments under a single command, it enabled "private capital" to undertake large-scale enterprises which otherwise would have to be left to the Government.

¹²The 6 patents—there were in all 10 but 4 involved the same patent; a fifth considered only a procedural point without discussing the substantive grant—to come to the United States Supreme Court before 1840 reflect the prevailing state of the industrial arts. Two concern inventions in agricultural devices—the one an improvement in the side-wheel of a grist mill termed a "wry fly", the other a device employed in the storing of grain. A third, a revision in the method of lifting water, was adapted to agricultural use. A fourth involved percussion priming in fire-arms; the fifth concerned a watch-chain manufacturing machine; the sixth laid claim to a device for felting wool to form hat bodies.

The character of the business unit was transformed. The corporation created the management, drew a sharp line between insiders and outsiders, established a hierarchy of offices. Persons at the top had authority over properties which in only the loosest sense were their own; they could play with their estates as feudal lords had played with their fiefs. But there was a difference; for a tenure resting upon the usages of election and a majority of shares was never quite secure. An item in red as a summary of a balance sheet was a threat to the capital structure which it was the principal duty of those in high places to guard. The corporate venture had to operate in a highly dynamic society; a measure of vigilance was essential to survival; the market for its wares must be fortified against invasion. Its strength lay in size, financial assets, preempted domain, power to dominate in any conflict. Its exposure to competition was a threat to its security. Immunity must be had through any instrument which might be bent to the purpose.

Into the economy came the corporation as a device of business collectivism. In the years after 1840, with its increasing prevalence, came a recession of opportunity. A textile industry of more than 1,000 separate factories crystalized into a pattern marked by a few large companies flanked by a handful of lesser concerns. At first the processing of iron was open to any individual who had access to an ore deposit. As its operation came to be an intricate technology, stereotyped into an array of interlocking machines, the ascending demand for capital was attended by a decline in the number of units. The railroad, short as was then its line, was a giant enterprise, which regimented men and materials, credits and capital, into a single operation. As its far flung arteries welded the activities of different sections into an industrial organism, so its impersonal organization provided a model for general use. In time even the welter of smaller ventures fell into the corporate form—and tended to become domains closed against individual enterprise.

It is hardly necessary to detail the trends accentuated by the Civil War. The struggle called a sluggish economy to attention; converted potential resources into apparatus of production; bequeathed to a country a vast plant capacity; gave full rein to all the acquisitive urges. The usages of the corporation were elaborated; its efficacy ceased to be questioned; its employment became traditional. A larger and larger section of the economy came to be overlain with a mass of corporate relationships. These differed greatly in kind and in strength, from the tightness of "parent" and "subsidiary" to the looseness of the vaguely interlocking directorship. The course of events has shaped its structure; countless situations, expediciencies, decisions are reflected from its lines. It possesses no outline cut to design; it is the kind of affair which blundered into being. But with its coming, financial pressures were enlisted in the cause of integration. As the myth of free enterprise became current, its reality fell away before the corporate estate.

In nature business is acquisitive; its high command has always employed aggressive instruments. The struggle between corporations for estates was well along before the patent right was put to militant use. For a time it occupied the honorific post of reserve weapon. The Robber Barons, who knew what they wanted and would not bother with indirection, had little time for so finicky a device. Even when

the Titans learned the amenities and perfected "the gentlemen's agreement," they persisted in being forthright. Dealer contracts, price agreements, ganging up on the chiseler, all had back of them the sanctity of contract or some extra-legal symbol just as efficacious. Even as a secondary device—to protect gains won by financial manipulation or the imposition of restrictive covenants—the possibilities of letters patent were little explored. The grant was an exclusive right and as such to be cherished. But it was kept within its orbit, a thing to be used, enjoyed, and freely alienated. It was, however, even as late as 1890,¹³ unburdened by covenants which ran with the chattel or radiated along the channels of trade. If the depressions of '73 and '93 were due to strictures within the economy, the complaint cannot be lodged against the patent system.

From the forties—and increasingly after the Civil War—great corporate estates appear in the national economy. As truly as the demesne of old, each of these demands its legal titles, its sanctions, the protection of its territories, the expansion of its frontiers, its armament of attack and defense. It is a task of no small magnitude to keep a corporate estate going. To enlarge the realm and increase its power calls for zeal, ingenuity, acquisitive skills, the larger strategy. In such an activity a grant of patent—a letter reciting an exclusive right which emanates from the Government itself—is a counter of consequence. It is at once a privilege, a legal warrant, a shield against attack—a versatile thing whose reach is as broad as the courts will allow, and whose possibilities only imaginative use can fully explore. In three distinct ways it operated to make secure the frontiers of corporate estates—and to restrict and modify individual enterprise.

The first was that the inventor passed into the background. He was accorded an exclusive license in respect to method, process, design, or machine. But unless he had funds with which to venture, he was in no position to exploit his grant. And, since machines were required to make other machines, he became beholden to the financier for the opportunity to make the most of his discovery. At first the situation was met with an expediency. A partnership was formed between the man of talent and the man of money; or the inventor arranged with some concern to make and vend the article and took a percentage of the profits. But eventually a clear-cut division of function was established. The inventor assigned his rights to a corporation; his claims were liquidated in a contract; the assignee came into full possession and was entitled to all the return the novelty could be made to yield.

The second was that the field for individual talent was restricted. The free lance inventor could no longer roam at will wherever his curiosity led him. As an estate was blocked off by patents, there was no longer a ready access to its arts. The insiders alone had a real chance to play with its mechanisms, to experiment with its processes, to suggest its next steps. If the process hedged off was superior to any alternative open, the independent had an empty and infeasible right to tinker. If from time to time the mystery, protected by law, could be refreshed with infusions of novelty, the domain might be closed against the stranger almost indefinitely. His only chance would be to take a new road, stumble upon a fundamental discovery, or project the technique from a new base. Even here opportunity is not

¹³ The Sherman Act was passed July 2, 1890.

for all. A radical shift comes as often as not from a transfer of a process from one industry to another—all under proper corporate auspices. Even if the departure comes from without, the established concern offers to the inventor his best—often his sole—market. Then again the demesne is closed until some lucky accident or flash of genius strikes a brand new trail.

As in 1790 the first patent act was passed, all industry was virgin territory. By 1840 a number of corporate estates had been staked out within the public domain. The old-fashioned inventor had no passport to enter the domains of iron and steel, agricultural implements, machine tools, and telegraphy. The established concern wanted no help from outside in the development of its technology. In the half century stretch to 1890 the great discoveries came in fields not yet subject to proscriptive right. Individual initiative found expression through Edison in electricity, Westinghouse in air-brakes, Eastman in photography, Ford in the motorcar, the Wright brothers in aeronautics. As in turn these were closed off, the man of talent had to accept the affluence of wage slavery, or from his garret seek to penetrate uncharted country.

The third was that the nature of invention was transformed. As the machine process was developed, it became an intricate affair broken down into many specialties. The concern of the individual was not with the whole technology, but with an aspect of it. This narrowed for the inventor the field of knowledge and the chance at experimentation. His creative gifts moved from a spatial to an interstitial orbit and his inventions tended to become refinements upon an accepted discipline. Advances were likely to appear within confined areas and to be of an esoteric character. Only in rare instances did they exhibit the indispensibility which marks the pioneer discovery. The step forward was under strict control; it must not depart too far lest it fail easily to be assimilated into the going art. It must not visit obsolescence upon expensive equipment or carry a threat to the financial structure.

Such changes came about slowly enough; an array of facts marked their direction before their trend could be clearly seen. It remained for an act of Congress to bring drift into focus, to make the patentee consciously aware of the possibilities in his grant, and to provoke into growth a novel scheme of usages. A spirit of unrest gathered momentum during the eighties. Little fellows were crushed, trades were barricaded against those who desired to enter, prices were made to carry all the traffic would bear, the doors of opportunity seemed to be closing, the public took legislative notice of the situation. In response the Fifty-first Congress went in for trust-busting; passed the Sherman bill; and outlawed every contract, combination and conspiracy in restraint of trade. The law of the land was invoked to break down barriers, to remove obstacles from the channels of commerce, to make competition the rule for industry.

It was not the purpose of Congress to amend the patent law. Not even the hint of such an intent appears in the debates. Yet, although their text was in nowise amended, the usages which had grown up to give protection to the inventor were completely remade. In the injunction that all men must compete and let the market do justice among them, the Government took the offensive. Gentlemen, to whom restraints were dear, looked around for an adequate defense against

such an attack and discovered in the patent a weapon deftly suited to their purpose. The writ came from the Government; it conveyed an exclusive right to all it covered. It was hoped that the privilege decreed for the invention might be converted into an immunity for the business; that exemption from law could be pushed along marketing channels so far as the contagion could be made to carry. The patent was a counter to be played for all it could be made worth. The passage of the Sherman Act created a situation whose implications business proceeded to make explicit in trade practice. Placing the point invited the counterpoint.

FACT FORSAKES THE LAW

An ancient usage cleared the way for the new strategy; the inventor assigned his rights to a corporation. In the act there is nothing novel; a contract between parties passes title along; the law recognizes the change in ownership—and that is all. In the economy the transaction extends far beyond its legal form; it falls little short of a transfer of the invention from one culture to another. It lifts the patent out of the province in which it is supposed to operate, separates it from the objectives it is supposed to serve, strips away the world of idea and custom which impinges upon it. It sets the grant down in a universe of business, makes it a counter in the acquisitive game, subjects it to the discipline of money-making. A radical change in its character attends the journey of the instrument to a new habitat.

Nor could the integrity of the invention withstand the change of climate. It remained a device capable of being put to industrial work; it became a technique to be enlisted in the pursuit of gain. Whether it was used, held in reserve, or laid away in moth balls was no longer to be dependent upon its intrinsic merits; instead its employment was to wait upon the exigencies of corporate policy. As with the invention, so too, with the progress of the art. A patent was a counter of consequence; but its limited term made periodic renewal necessary. As patents lived out their span of years, others must be had to replace them. Improvements were necessary; and to make secure its realm, the corporation created a research agency.

The conduct of research became a response to corporate policy. One held, for the duration of his patents, as a tenant of the Government itself. If a few basic patents could be kept alive, the estate was in perpetuity. Yet an excess of zeal in the pursuit of invention was to be avoided. More novelty might be turned up than the going concern could easily assimilate; a jeopardy to an interest already vested was to be avoided. Next steps become imperative; and they must be of such a kind as to maintain an advantage over the competitor who had access only to technology upon which patents had expired. But a strong presumption was set down against the radical innovation. In every instance judgment turned, not upon the up-to-date or backward state of the art, but upon such considerations as estimated expense, threat to investment, the protection of old and the conquest of new markets. In a word the corporate office of invention was severely defined.

As the corporation became master to his profession, the inventor passed into its service. As he accepts a pecuniary allegiance, a vestige of his own status is reserved to him; the device or process which he

contrives is initially his property; he applies for a patent and it is issued in his name. But there the cloak of a nominal independence is put off; he is an employee, he works for a salary, his contract obligates him to sign away his rights. He is no longer free to roam at will where the urge of curiosity leads; his talents are pent within the corporate field; his tasks fall within the ambit of its operations. He may look ahead, explore, and propose; but it is for the executives to decide how his capacities are to be employed, the lines along which his researches are to extend. His quest after knowledge is strictly subject to business direction. He is devoid of authority over the making, vending, and using of his machines. In instances he may receive a bonus graduated to the sales of the things he has contrived. But in the usual case the connection between the reward to the inventor and the returns from the invention is completely broken. Like a lawyer or an engineer he receives as much as, and no more than, the market value of his services. The research technician, who has succeeded the solo inventor, has become a hired specialist creating monopolistic credits which after corporate endorsement are put into circulation.

But if the inventor has fallen into bondage, the rivalry between corporate estates continues. Like nations intent upon the game of power politics, they seek to maintain and to expand their dominions. Each has its arsenal of weapons with which to ward off, buy off, eliminate, or sterilize with a dictated truce all who may challenge or impede. In the fray not one, but a number of patents, may be hurled at the enemy. The conflict is strenuous, the field for maneuver wide. The protagonist must vary his attack, seize his openings, capitalize all breaks. Victory is to the strong and the resourceful. Firms of inferior financial strength hesitate before going into such a struggle. The patents they hold may be of high value, but frequently they prefer such validation as a process of bargaining may give to the hazards of a resort to court. A grant of intrinsic value is a card with which to buy entrance into a patent pool. Another, a mere nuisance which it would cost a struggle to abate, often serves quite as well. The accords between large corporations and lesser firms often reflect relative strength of the parties. And the validity accorded or denied to patents, in whose name the arrangements emerge, are little more than the rhetoric of justification.

As invention is harnessed to acquisitive ends, the defense must be secure, the attack ever ready. Its armament must be adequate to any campaign and equal to any emergency. The first requisite is to fence in its industrial preserves. But technology is a voluminous and intricate affair; its processes cross, overlap, intermingle. As scientists serve many interests, private claims come into frequent dispute; norms, knowledge, understanding are not beyond peradventure. The business firm, however conservative its research attitude, is much concerned over the number of its patents, and seeks for every aspect of its productive process the coverage of a legal umbrella.

It may be that only a few of the inventions are actually employed; the solid phalanx is terrifying to competitors and to upstarts who would trespass upon its market. In the manufacture of an ordinary Mazda light, the General Electric Co. uses less than a score of patents, yet the number of its grants exceeds 300. The imperium of the United Shoe Machinery Co. is barricaded by some 6,000 patents.

Dupont, Hartford-Empire, RCA-Victor have piled patent on patent to secure against invasion the whole range of their activities.

In business, as in war, a vigorous offense is the best defense. A portfolio of patents provides sanctions which, if the staying power is not lacking, will last out a long campaign. Not the least among the weapons which it has called into being is the infringement suit. It has become accepted practice for a concern to harass its competitors with threats; and, if threats do not deter, to take to law.¹⁴ In 1894, for instance, the Eastman Kodak Co. brought an action against the Boston Camera Co.; its initial move was to secure a preliminary injunction against the manufacture and sale of its rival's products. In the struggle, the temporary stay was the trump card, and the ultimate outcome almost an irrelevance. Although the injunction was eventually lifted and the aggressor adjudged to have been the real infringer, the mischief had been done, and Boston Camera was persuaded to transfer its ownership to Eastman Kodak.¹⁵ A repetition, with variations, of this ruthless strategy had its effect; within 4 years it had won for Eastman a virtual monopoly of the field of photography it had staked out for itself.¹⁶

A similar instance is presented by the United Shoe Machinery Co. The basic inventions go back before the Civil War; they have been refreshed from time to time as needed. In an involved series of transactions almost all the patents which have to do with making the machines by which shoes were made—dominant and ancillary, sequential and competitive, along the horizontal and along the vertical line—were gathered under a single ownership. United, continuing a practice of long standing, chose to lease rather than to 'sell outright its machines. Since as patentee it could dictate the terms upon which its technology could be used, it became overlord to the shoe industry.

At the time the Government launched its suits against the corporation, United had pending against competitors more than 100 actions for infringement. Out of the total it was able to win only 25 suits; yet many who could not be downed in court succumbed to the financial drain of protracted litigation. The Plant Co. was heavily entrenched behind its own patents; its series of grants comprehended the entire process of manufacture. But the infringement suit is no simple

¹⁴ In general, threats of suit will not give rise to an action for damages or an injunction unless the plaintiff can show actual bad faith. The practice of threatened suit against users of products manufactured by a competitor has been condemned, however, by the Federal Trade Commission and by the courts. Cases against the *Racine Paper Goods Company*, 164 Fed. 85 (1905), affirmed 177 Fed. 631 (1909); the *National Harrow Company (Adrian, Platt and Company v. National Harrow Company)*, 121 Fed. 827 (1903); and the *National Cash Register Co. (U. S. v. Patterson)*, 205 Fed. 292 (1913), disclose the popularity of the practice in the first two decades of this century. See also *United Electric Company v. Creamery Package Co.*, 203 Fed. 53 (1913); *Clip Box Manufacturing Company v. Steel Protected Concrete Company*, 299 Fed. 874 (1913). A certain tactic serves its turn, and when it is definitely outlawed another is contrived to take its place. As late as 1921 the Federal Trade Commission was issuing cease and desist orders against this type of practice. Annual Report, F. T. C., 1921, p. 449, complaints Nos. 126 and 224; *ibid.* 1919, p. 60, complaint No. 29; *ibid.* 1918, p. 75, complaint No. 10.

¹⁵ See *U. S. v. Eastman Kodak Co.*, 226 Fed. 62 (1915), pp. 68, 69.

¹⁶ The Kodak Co. was adroit at using superior economic power to facilitate a patent control which was then employed to continue its coercive activities. (1) By means of contracts Kodak persuaded its licensees to admit the validity of its patents and thus estopped them from further challenge in the courts. This is a common practice followed by such reputable concerns as Columbia Phonograph, United Shoe Machinery, Weed Tire Chain, General Electric, and American Optical. (2) In instances a Kodak license was conditioned upon the payment of royalties on cameras which did not embody any of the Eastman processes, *U. S. v. Eastman Kodak Co.*, vol. 7, p. 3481, Defendant's Exhibit 35. In consequence (a) the prices of competing cameras were based upon double royalty payments; (b) Eastman retained an equity, graduated to the payment it induced, in its competitor's patent; and (c) the licensee was induced to use the Eastman patents rather than subject himself to pay double tribute.

bludgeon. In its employment the technique of the boycott has been caught up, and all who patronize the recalcitrant firm mark themselves as "contributory infringers." For a time the independent held its own. But actions against the company itself—and against its customers—had their cumulative effect and in the end the rival business was brought under the hegemony of United.¹⁷ Its competitors were no longer able to challenge a strategic position, barricaded by resources for the long fight and the will not to stop short of ultimate victory. As one by one rivals have come to its terms, its bottleneck has become a national institution.¹⁸

The infringement suit moves within a wide orbit; it can, within many situations and in many distinct ways, promote the cause of monopoly. If the demand is to crush an enemy or to take over his business, it is a handy weapon. If, instead, the desire is "to live and let live," it becomes a handy club with which to dictate terms. In not every instance is it feasible—or even desirable—to eliminate every hostile unit. The concentration of control has an ugly sound; and public relations dictate at least an appearance of competition. Wisdom concurs; for a field devoid of the shadow of rivalry presents an invitation to trespass. It is enough to limit the other fellows to "a fair share of the market." Legal action—or its threat—can be used to bring other devices of accord into play. After all bankruptcy for, annexation of, playing ball with the enemy are alternative methods for abating a relationship which carries a financial threat. It may be better to absorb than to kill off; it may be even better to reduce to dependence than to absorb. Dominion is their common goal; the choice among them, a question of expediency.

As the overlord extends his power, a number of practices may be employed to maintain the imperium. The situation is made to order for the corporate person who seeks to fortify monopoly with letters patent. By their sanction he incorporates his authority into arrangements which constitute a government for the trade. The license with terms, the exclusive franchise, the control of resale price, the use of block-price schedules, the imposition of conditions in respect to unpatented materials, the quota arrangement are practices to be maintained along the channels of marketing. Of such usages, to be employed singly or in elaborate designs, there can be no scarcity. If one plan fails, or encounters a veto in court, another can quickly be concocted to take its place. A failure in resourcefulness alone can put a stop to so obliging a strategy.

And the sanctions by which competitors are overcome can be used against the public itself. An ancient adage unites with modern medicine to make immunity the perfect answer to attack. The Government issues its patents conferring exclusive rights; and their recipients, when haled into court charged with monopoly, produce their letters as warrant for their activities. The protection accorded the invention is cunningly stretched to cover art, process, materials, business unit, marketing channels, associates by contract. It goes

¹⁷ The incident, still subject to acrimonious dispute, has become a classic episode in the concentration of wealth. It had far-reaching implications; for instance, it played a significant role in the hearings on the confirmation of an appointment to the United States Supreme Court. See Senate Hearings on Louis D. Brandeis, 64th Cong., 1st sess.

¹⁸ The author has been afforded access to an unpublished manuscript by McClellan Butt on "The Pattern of the Shoe Industry" in which the trade practices of United are set forth in detail.

out, as a kind of magic, to sanctify all it may touch to the third or fourth remove. It engenders a resistance which puts every transaction, whose essence or incidence concerns a patent, without the law. Its trend is to cut up all technology, or as much of it as enjoys legal protection, into holdings which lie outside the province of government.

Ingenuity, always ready to enlist in the pursuit of gain, awaits only its occasion. If before 1890, the usages of restraint seem strangers to the patent-system, it is because no attack on its preserves had revealed their presence.¹⁹ The passage of the Sherman Act sounded the alarm and corporations were quick to apprehend the rising legal danger. Almost at once they began to fortify the practices at which antitrust might thrust with sanctions derived from letters patent. In this humane endeavor almost every rule, device, concept known to the law—lease, contract, agency, outright purchase, corporate reorganization, integration—was harnessed to the writ of the Government to create exemption from its attack. From the law reports can be extracted an array of “plans”—varied, ingenious, colorful, dramatic enough to stage a spectacular parade. At the height of the movement a Federal judge could make the patentee lord of all he surveyed; find him free to do as he pleased with an absolute of property which was his own, discover that the law did not impose upon him a standard of fairness and exempted him from the obligation to do justice.

The result of all this was to drive a barrier between current reality and legal presumption. In theory the grant assumes the individual inventor, a contribution to a developing art, the invocation of law to assure to its author the just reward of his personal creation. It takes no account of the rise of the corporation, the character of the act of assignment, the shift in the system of usages under which it is called upon to operate, the alien tasks imposed by its new business master. But legal fiction can become raw material to a living institution. Sheer unreality—if only it has currency—is an asset crying to be turned to account. As the assignee, the corporation claimed “the exclusive right” of “the sole and true inventor.” It substituted the pursuit of gain for “the progress of the useful arts” which the grant was intended to serve. Thus it set about appropriating a judicial blessing upon the struggling man of genius to the security of an industrial empire.

As currency the letters circulated in another domain and at other than their original value. But if courts were inclined to indulge the myth that the patent held the place in the national economy it occupied as late as 1840, it was not for those whose concern was money-making to set them right. If the Congress neglected to bring its instrument into accord with prevailing conditions, it was not for those who could turn its omissions into hard cash, to write modernity into its lines. As current fact was promoted into legal fiction, the corporation did no more than take acquisitive notice of the backward state of the legal art.

¹⁹ Resale price maintenance was at the time already coming into vogue; it is referred to in the debates upon the Sherman bill. On the floor of the Senate the question was raised as to whether it was outlawed by the proposed measure.



CHAPTER IV

ALTERNATIVE PATHS FOR THE LAW

RUMBLINGS OF DOCTRINE

Almost exactly a century separates the Patent Act of the First Congress from the antitrust mandate of the Fifty-first. A span of just about 100 years lies between the first attempts of the courts to grapple with the problem and the current demand of the Department of Justice that the Government's letter be restricted to "its lawful orbit" and the supremacy of the general law be restored in the province of invention. These half-century marks—1790, 1840, 1890, 1940—have little casual significance, yet their regular beat makes them convenient dates on which to hang an analysis of the rights accorded "the true and sole inventor."

A private stake in a public domain in its very nature involves a clash. It is to the Government a consideration made over to induce the progress of the industrial arts. It is to the patentee a right in the invention from which during its life other parties are to be excluded. The Government seeks to make finite what it gives up; the patentee seeks to enlarge his privileges as far as he can. To him the letter becomes an instrument of security, a weapon of industrial attack, a shield against action by the state. From the very first in England and in the United States the grant has been used to insulate its holder against the risks and rigors of competition. As handicraft and individual enterprise have fallen back before the machine process and the corporate estate, the grant of patent has made its response. Its significance inheres in the usages converging upon it; and, as business has intruded with its folk-ways, its identity and its place in the national economy have been changed. Accordingly the very issue of private claim against public equity—which over and over again the courts have been called upon to entertain—can be reduced to no set terms. Again and again the question has been restated even as they were attempting to answer it.

In any domain of the law the first sheaf of decisions is of utmost importance. Emerging from cases of first impression they give direction to the lines of doctrine. Yet it often happens that commitments are made when the implications of positions cannot be fully explored and even before the issues are all in. Invention has been a changing fact in a dynamic society and even the wisdom of judges has not always been able to reach across the decades fully to comprehend the legal instrument they were decreeing for its protection. They could anticipate, but not with concretions, the position which technology was to have in the economy. They lacked instances out of which to create pictures of net-works of restrictive trade practices woven about patent grants. It was upon the legal level that they encountered industrial arts in transit; the distinctive learning which they brought to their deliberations was in the law, rather than in industrial analysis or

science. In the law they were, according to their several bents and experiences, very differently versed. There was the line in the Constitution and the provisions of the statute which gave it effect. But this was vague and lacked signposts to usher a command through specific situations. Guidance must come from the general law: and like the Bible the general law is an august corpus whose treasures are so ample as rarely to disappoint the man who seeks its authority.

As destiny would have it, the patent in its initial bow presented to the United States Supreme Court an issue in private law. The first cases raised questions of procedure and conflicts over personal equities. Their primary concern was such enigmas as the validity of a defective grant and the type of action available to a part assignee. Only on their fringes, in a concern with "novelty" and "conception," did ideas basic to the patent system appear. Of the 10 patent actions heard before 1840, several contained rudiments of doctrine subsequently to have weighty influence on the direction taken by the patent law.¹ Only 2, however, discuss specifically the relationship of the inventor to the public generally; only one gave the jurists an opportunity to expand the patentee's obligations to society.² No issue concerned with trade practice can be discerned in any one of the 10 cases.

The exception bears the intriguing title of *Pennock v. Dialogue*. Its question of law was whether the invention had been put to public use prior to the application for patent; and, if such were the case, whether such use was to be construed as an abandonment of his "exclusive right" by the inventor. An argument given a proper start can as often as not be depended upon to look out for itself. In need of a norm, Mr. Justice Story, who spoke for the Court, went directly to the Constitution. To him it was obvious that the dominant concern of the patent system was the promotion of science and the useful arts. The reward was of secondary importance; and, if the end were

¹The cases are *Tyler v. Tuel*, 6 Cranch 324 (1810); *Evans v. Jordan*, 9 Cranch 199 (1815). The case holds that a patentee possessing a renewal patent may abrogate any rights possessed by an unlicensed user of the patented machine even though the latter has commenced use prior to the grant of second patent. The case, while never cited for the proposition, presages a later separation of use as a right independent of possession or ownership. *Evans v. Eaton*, 3 Wheat. 454 (1818); *Evans v. Eaton*, 7 Wheat. 353 (1822). Here the Court struck down a patent containing claims broader than the scope of novelty. As an incidental point the Court asserts as one of the purposes of the specification in a patent grant, the conveyance of information to innocent users who might otherwise be infringers. *Evans v. Hettich*, 7 Wheat. 453. The case is a companion case of the *Eaton* litigation. *Ex parte Wood*, Wheat. 603 (1824); *Keplinger v. De Young*, 10 Wheat 358 (1825). The case, the first on contributory infringement in the Supreme Court, found it permissible to contract for the manufacture of watch chains on a patented machine, even though the purchaser of the chains knew that such manufacture constituted infringement. Had this doctrine been applied in the *General Talking Pictures* case, *infra*, p. 80, the decision would almost certainly have gone the other way. *Pennock v. Dialogue*, 2 Peters 1 (1829). This case, discussed in the text, holds further that a novel invention, once given to the public, cannot be recalled in the form of a patent. *Grant v. Raymond*, 6 Peters 218 (1832). This case held it permissible to reissue a patent and estop from further use the builder of a machine which, while outside the claims of the original grant, was covered in the reissued letter. *Shaw v. Cooper*, 7 Peters 292 (1833). This case regarded a reissued patent a continuation of the original grant, but held that such reissue could not take from the public that of which they were fairly in possession—a doctrine suggested in the *Pennock* case.

²*Pennock v. Dialogue*, 2 Peters 1 (1829). In *Grant v. Raymond*, 6 Peters 218, 241 (1832) the Court, through Chief Justice Marshall, declared that in construing patents and patent laws inventors should be liberally treated. See also to the same effect *Winans v. Denmead*, 15 How. 330, 341 (1853). The dissent of Mr. Justice Campbell, with whom concurred Mr. Chief Justice Taney, and Messrs. Justices Catron and Daniel is illuminating (p. 347): "To escape the incessant and intense competition which exists in every department of industry, it is not strange that persons should seek the cover of the Patent Act, for any happy effort of contrivance or construction; nor that patents should be very frequently employed to obstruct invention, and to deter from legitimate operations of skill and ingenuity. * * * Fullness, clearness, exactness, preciseness, and particularity, in the description of the invention, its principle, and of the matter claimed to be invented will alone fulfill the demands of Congress or the wants of the country. * * * In my judgment, the principles of legal interpretation, as well as the public interest, require that the language of this (the Patent) statute shall have its full significance and import."

attained without the use of the instrument, there was nothing to worry about. It followed—almost if not quite “of course”—that public use before its issue was fatal to the exclusive character of the grant. A quarter century later, through Mr. Justice Daniel, this holding was underlined. The “remuneration of genius and useful ingenuity is a duty incumbent upon the public.” Yet “the rights and welfare of the community must be fairly dealt with and effectively guarded.” Therefore “consideration of individual emolument can never be permitted to operate to the injury of these.”³ The two judgments imposed upon the patentee the obligation to act in the general interest.

On each occasion the office of the patent in the commonwealth was proclaimed from the bench. In each opinion it was stated that responsibilities were mutual; that the duty of the patentee was commensurate with the privilege granted by the public; that without reciprocity the obligations of contract were binding upon neither party. It was specifically declared that “actions by the patentee detrimental to the rights and welfare of the community could not support a continuation of the monopoly grant.” The theory of judgment was that the patent derived its value from the contribution which the invention made to the general welfare. In a word, privilege was the instrument of policy.

A shift to a more legalistic level was no conscious choice of the court. It could talk about patents only as cases came along; it could discuss them only in respect to issues which they presented. If dominant questions did not come along to keep major values to the front, the bench conscientiously ground such a grist of small grain as found its way to their mill. So decisions on lesser matters usurped the place of primacy, blurred perspective with their immediate importance, and left in the reports sentences later to be endowed with an increment of fresh meaning. On such a plane many strands of the law may converge upon the issue; precedents are as diverse as the subjects to which they relate. In his choice of approach, category, doctrine, the judge’s result is locked away. The very wealth wherefrom to choose invited jurists to take acceptable paths.

The first of such cases, *Wilson v. Rousseau*,⁴ reached its judgment by reference to an act of Congress. A grant of patent had in due course been renewed. Under the original instrument the patentee had assigned the right of use without imposing restrictions. No such license had been issued after the renewal; the patentee insisted that rights bartered away expired with the grant which gave them validity, and sued for infringement. A line of flawless dialectic had it that a derivative privilege could not survive the original right from which it stemmed. Yet the court, elevating a Federal statute above such an exercise in logic, decided the other way. A provision of the patent law of 1836 accorded to all outstanding assignees and grantees the right of use under the renewal. The decision did not tax the ingenuity of the Court; Mr. Justice Nelson had only to cite the statute and record the decision.⁵

³ *Kendall v. Winsor*, 21 How. 322, at p. 329 (1858).

⁴ Howard 646 (1846). Mr. Justice McLean, Mr. Justice Wayne, Mr. Justice Woodbury dissenting.

⁵ 24th Cong., sess. I, ch. 357 (1836), “an act to promote the progress of useful arts, and to repeal all acts and parts of acts heretofore made for that purpose.” Approved July 4, 1836. Nelson added public policy arguments to his statutory interpretation (pp. 683-684), but these lacked the clarity of Taney’s presentation.

But where Congress had decreed, the Court could supply reasons. Six years later, in *Bloomer v. McQuewan*,⁶ Mr. Chief Justice Taney fitted out the legislative act with a proper rationale. The man purchasing a machine for use acquires all rights essential to its operation. In its entirety the mechanism becomes his personal property. To him its value depends upon the employment to which it is put; in no wise is it dependent upon whether others are excluded from its use. Unless he can acquire the article outright, he has no incentive to purchase. He has no interest in possessing a mechanism which at a certain date is physically able to carry on yet legally goes dead on him. A machine, with function intact and legality impaired, is a phenomenon too incorporeal for the ordinary man to contemplate. In consequence an assignment is a complete liquidation of the patentee's interest in the manufactured product. The purchaser is free from all limitations to which the patentee may later become subject.

No dichotomy of common sense against legal compulsion disturbs the general lines of the argument.⁷ The next two cases to come along do little more than give added authority to the ruling.⁸ But in a third case,⁹ the Court rather deliberately restricts the province within which the patent enjoys legal protection. A patentee had restricted the licenses which he issued to geographical districts. A buyer had taken a patented article across the boundary line and had put it to work in forbidden territory. In the *Millinger* case, Mr. Justice Clifford, exalting a ruling into a generalization, had scribbled, "By a valid sale and purchase the patented machine becomes the individual property of the purchaser; and" note the consequence—"is no longer especially protected by the laws of the United States, but by the laws of the State in which he is situated."¹⁰ Mr. Justice Miller, speaking for the Court and enlarging upon this dictum, broke down the legality of territorial arrangements, at least in respect to use.

It was an easy jump from Taney's rhetoric to Miller's ruling. Yet a year earlier a breach had been decreed in its rationale and a conflicting holding set down. In *Mitchell v. Hawley*¹¹ the patentee had licensed the manufacture, use, and sale of his felting machine. In the contract it was specified that the privilege assigned was not to extend beyond the original grant, and that any conveyance of a manufactured machine was to be upon the same terms. A purchaser from the licensee had continued to use the purchased machines after the original letter had expired and a renewal had come into effect. He was hailed into court as an infringer to discover that the doctrine of *Bloomer v. McQuewan*, upon which he relied, was not pertinent to his conduct. Mr. Justice Clifford, with an appreciation of the orthodox relation of the whole to its parts, argued that the buyer

⁶ 14 Howard 539 (1852).

⁷ *Bloomer v. McQuewan*, op. cit. at p. 549-550, " * * * the laws of the United States * * * of the State." The reader must not be confused by Taney's employment of the rhetoric of federalism. The justice uses the idiom of constitutional law, yet the economic meaning is perfectly clear. The invention, as embodied in the particular machine, was no longer subject to legal protection. If it should be resold, the right to its full employment would doubtless pass with title. The States, of course, were doing nothing to give effect to the statute on patents beyond its proper Federal orbit.

⁸ *Chaffee v. The Boston Belting Co.*, 22 Howard 217 (1859); *Bloomer v. Millinger*, 1 Wallace 340 (1863).

⁹ *Adams v. Burke*, 17 Wallace 453 (1873). Bradley, Swayne, and Strong, Justices, dissenting.

¹⁰ *Bloomer v. Millinger*, 1 Wallace 340, 351 (1863). See *Bloomer v. McQuewan*, op. cit.

¹¹ 16 Wallace 544 (1872).

could possess no more ample equity than the seller could give him. Since the vendor's rights were circumscribed by contract, like limitations were imposed upon the purchaser. Moreover, if there was doubt, the law imposed upon the vendee the burden to prove that the person from whom his rights derived was able to convey a good title and unrestricted use. Since that challenge had not been met, the Court was powerless to help the unfortunate user.¹² In the instance the Court failed to come to grips with the issue in patent rights which the case presented. Instead, Clifford argues as if it were a private suit, to be resolved by reference to the severities of the law of sales. In the opinion he ignores the *McQuewan*¹³ holding, dispenses with citations, omits the practical approach of Taney, avoids the broader perspective of contract doctrine. He seems unaware that his line of argument is out of step with the march of holdings; and, even when it came into the open a year later, he did not seem to recognize the logical schism.¹⁴ That another branch of the law might apply, and the restriction be accounted void as against public policy, he does not recognize.¹⁵

These are the primary decisions; a couple of follow-up cases provide a fringe of comment. In *Wilson v. Simpson*,¹⁶ a simple set of facts was before the Court. Knives in a planing machine—they wear out with amazing rapidity—were replaced by the purchaser without leave of the person from whom he had bought. In words enlisted in the service of abstraction, the issue was whether renewal of parts, or recomposition of materials, to form an equivalent of a patented mechanism, constituted an infringement of the grantee's exclusive right. The dialectic of decision was made to pivot upon an antithesis between "replacement"—or "restoration"—and "reconstruction." Restoration was no more than obsolescence plus renewal. As a process for keeping the machine alive and in operation it was an attribute of use. Reconstruction, on the contrary, was taking the wreck of that which had once been a going machine and creating it anew. The court, through Mr. Justice Nelson, held that where the substitution of new parts was made necessary by "natural processes of wear or injury," the act of the user was "restoration" and not "reconstruction." It was therefore not subject to the domination of the patentee.

¹² It is of note that the certificate given the purchaser by the licensee contained the terms of limitation under which the licensee operated. This the court held to be notice to the purchaser of the restrictions under which the title to the four machines was conveyed to him.

¹³ Clifford mentions the *McQuewan* case in the general summary of the law with which he introduces his opinion. It plays no part in the syllogism which settles the issues.

¹⁴ The attitude of various justices indicates the failure of the Court to grasp the larger issues which, from the vantage point of our day, are clearly visible. In spite of all he says here, Clifford concurred in the opinion of Miller in *Adams v. Burke*, op. cit. p. 54, a year later. Strangely, too, in that case—neither in Miller's opinion nor in Bradley's dissent—is any mention made of *Mitchell v. Hawley*, op. cit. p. 54.

¹⁵ The issue, with the elaboration of trade practices on the theme of the patent grant, was later to assume major proportions. It is perhaps too much to ask, even if a justice, to look ahead to the problems with which we are currently faced. But it is of interest in passing to note that the culmination of the Clifford doctrine appears in the opinions of the Supreme Court, via Butler and Brandeis, J.J., in *General Talking Pictures Co. v. Western Electric Co.*, 304 U. S. 175, 305 U. S. 124 (1938). In the cases of *Sanitary Manufacturing Co.*, 226 U. S. 20 (1912), *Motion Pictures Patents*, 243 U. S. 502 (1917) the Court has apparently swung far away from the position taken here. But the sales doctrine, supported by the logic of the whole and the part, has its intermittently immortality, and it might as well have been Clifford J., instead of Butler, J. and Brandeis, J., who spoke for the Court in the *General Talking Pictures* case. For a discussion of these later cases, see pp. 65-70, 84-85 below.

¹⁶ *Wilson v. Simpson*, 9 How. 109 (1850).

A similar problem arose three decades later in the *Cotton-Tie case*.¹⁷ Metal ties licensed under a patent for use "once only," were purchased as scrap, recombined with metal strips, and made to duplicate the invention. The Court, through Mr. Justice Blatchford, held that such an act of renewal was "not repair of the bond or the tie in any proper sense"; that it did not present a replacement of temporary parts destroyed in use; hence that it was not governed by the holding in *Wilson v. Simpson*. The line between might be nebulous; it might by the forces which shape legal doctrine be pushed one way or the other yet the formula with its antithetical categories had been called into being.

Three of these judgments became classic. They were the kind of foci from which radiate lines of doctrine and courses of action. In Nelson's opinion in the *Rousseau case*, Mr. Justice Wayne found authority for the proposition that the thing patented is the thing invented.¹⁸ The result was to leave any innovation not named in the grant at large, and presently to dispel the modesty of the applicant in the statement of his claims. He ceased to resist the temptation to encroach upon the common art in staking out the privileged demesne. In *Adams v. Burke*, Miller set it down that the rights to make, to vend, to use, are quite distinct things, which in severalty can be disposed of as seemed to the patentee good. His simple statement invited the elaboration of the license which reposes in the grant into an intricate structure of personal and corporate equities. In the *McQuewan case*, Taney had asserted that "the franchise which the patent grants consists altogether in the right to exclude everyone from making, using, or vending the thing patented, without permission of the patentee." In summary he added, "This is all he obtains by the patent." The word "franchise" is significant;¹⁹ it makes the writ a kind of a license to put the invention into use; and supplies canonical authority to the judge who holds that the exclusive right—plenary as it may be within its domain—is pent within narrow boundaries. Two of these leads unite in the development of an intricate institution about the patent grant; the third is an injunction to the courts to trim from legal privileges all artificial growth.

No compulsion from within accounts for these rulings. The series of early decisions exhibits the jurist's craft in its variety. A number of techniques are separately employed to approximate a similar result. In *Pennock v. Dialogue*, Mr. Justice Story makes a line in the Constitution his reference; in *Wilson v. Rousseau*, Mr. Justice Nelson invokes the words of an act of Congress. In *Bloomer v. McQuewan*, Mr. Chief Justice Taney explores the nature of the property interest which passes with title; in *Adams v. Burke*, Mr. Justice Miller puts contract to the front and holds that once "a patentee or a person having his rights sells a machine or instrument whose whole value is in its use, he receives the consideration for its use and parts

¹⁷ *Cotton Tie Co. v. Simmons*, 106 U.S. 89 (1882).

¹⁸ Nelson took his statement from Mr. Justice Baldwin's opinion in *McClurg v. Kingsland*, 1 Howard 202 (1843).

¹⁹ Here is the germinal line for "the franchise" idea of the patent. It is easy enough, if lines a little askew may be straightened and an occasional exception indulged, to superimpose such a pattern upon patent holdings. The point is that it is superimposed; it would accord with reality if generally the justices who spoke for the Court conceived of a patent in franchise terms. The discussion above has indicated several rival concepts, and the growing complexity of patent usage has not decreased their number.

with all his rights to restrict its use.²⁰ In contract, in *Mitchell v. Hawley*, Mr. Justice Clifford does not choose to employ any of these approaches and falls back upon a syllogistic logic which at the time was quite at home in the domain of sales. It is to him a license rather than a machine which is passed on, and his concern is to keep the certificate in strict accord with the power to issue.

Yet differences in legal rhetoric cannot conceal an underlying rationale common to all the cases save one. It was largely in connection with use that the Court first encountered the patent grant. If the dominant word in quest of definition had been "make" or "vend," the result could have been little different. The three infinitives—to make, to vend, to use—are prongs of the same legal right. In use the accord falls upon the aspect furthest removed from the inventor's art: it concerns a limitation upon privilege that carries least hazard to the advance of science. But, the piece from the Clifford workbench aside, the Court in all the cases and over a period of years, exhibits a disposition to construe the patent grant narrowly.²¹ Although each communicates his reasons in his own legal idiom, the values which in case after case run to judgment are much the same. Only in the *Chaffee* and the *Millinger* decisions does the structure of the opinion remain frigid. In all the others the spokesman for the bench broadens his premises to make easy the course of his argument. In their march legal reasons obey the dictates of policy.

For the half-century, 1840 to 1890, the patent law was shaped by these early holdings. As with the first of their kind, they were recited over and over again as of unusual authority. As new cases came along, they supplied the norms of reference. As novel issues were presented, from between their lines principles were drawn forth to guide deliberation to its result. Again and again sentences from the texts were cited with appropriate gloss as later occasions came to command.

A MAN AND HIS OWN

The law of patents was off to its start. In the usages of assignment and license; in such germs of doctrine as use, public interest, replacement; in a group of such concepts as sale, contract, property, franchise; in the pioneer opinions of the Court were all the elements needed for the erection of an edifice of equities and a lordly dialectic. A national economy, impelled by a dynamic urge toward a destiny unknown, was creating industries, marketing structures, trade practices. The rule of catch as catch can touched off conflict and supplied the courts with cases. The executives of business were adept at making the most of judicial holdings. If jurists did not foresee, in the fullness of its detail, the institution which was to grow up about the patent grant, its architects shaped their edifice to the very words of the law.

From days of old the law has accorded a man the right to do as he will with his own. But the same law has limited "his own" to the things it has permitted him to do. An early case had decided that a patent belonged to its owner for the purpose of being used; and if, like the

²⁰ *Adams v. Burke*, op. cit., supra, p. 456.

²¹ It is of interest that the broad grounds taken by Story, Nelson, Taney, and Miller, J.J., tend to a narrow construction of the instrument, while the severe lines of Clifford, J., serve to broaden its privileges.

ten talents in a napkin, it was laid away, its owner's title was subject to a rapid legal obsolescence. But profits often come by way of mothballs; and in the face of the words of the court,²² once again a person attempted to suppress his invention and to keep his legal rights in it alive. And again a court held that a patent which its owner refuses to make available runs counter to the clause in the Constitution which grants its exclusive right as consideration for the promotion of the useful arts. It insisted that "patents so held are entitled to scant recognition at law, though necessarily to some, but to none whatever in equity."²³ Yet technology was becoming formidable; pressure was persistent; despite its cogency, this view could not hold its own against a tide sweeping in the other way.

It was, however, not until more than a century after the first patent act that the right of suppression came into the patent law. A button fastener, a case not of first impression, and an inferior Federal court conspired to turn the tide. In a famous suit, a learned bench of three—Lurton, Taft, and Hammond, JJ.—gave legal sanction to a practice most useful to corporate enterprise.²⁴ The opinion of Lurton, concurred in by his brethren, is a finger exercise in logic, which makes explicit a result skillfully tucked away in the premises. The reach of the patentee's privilege is not explored; its content not examined. It is enough that his title is "exclusive." The invention is his property—but there is no consideration of the nature of property, of the equities into which it is organized, of the appearance in motley which it makes before the law.²⁵ The holding of *Hoe v. Knapp* was brushed aside as dictum, unsupported by the natural and inherent powers accorded the recipient of the grant; the word "exclusive" is read as absolute; the right is a functionless sort of affair; no reference is made to the norms provided by the Constitution. Instead, the power of the patentee is "so clearly within the constitutional provisions in respect to private property that he is neither bound to use the discovery himself nor permit others to use it." In short, the real issues were not argued; the things argued were not issues.

The judgment was not outstanding at the time; it was what came after which made it a turning point for the law.²⁶ Its opportune timing and the distinction of the bench presently brought it prestige.²⁷ And, since it was in step with the course of business events, corporations seeking to secure their estates, found it useful. If, however, it was to circulate at face value, it needed the imprimatur

²² *Hoe v. Knapp*, 27 Fed. 204, 212 (1886).

²³ *Evart Manufacturing Co. v. Baldwin Cycle Chain Co.*, 9 Fed. 262, at p. 265 (1898).

²⁴ *Horton-Peninsular Button Fastener Company v. Eurcka Specialty Company*, 77 Fed. 288 (1896).

²⁵ It is of note that Taney, C. J., and Lurton, then judge, alike approach the patent as a property and arrive at almost antithetical results. In *Bloomer v. McQueenan*, Taney encounters the machine in the hands of its purchaser; in the Button Fastener case, Lurton's focus is the perquisite of the grantee. Taney's concern is with a property in chattels, such as the State law seeks to define; Lurton's in a right which seems to lie beyond the province of government.

²⁶ Whatever forces were to mold it, at the time the law was plastic as clay. What seemed axiomatic to one Federal judge was anathema to another; each argued from his own assumptions and differences in postulates were not submitted to the furnace of judicial consideration. To give to the right to suppress the sanctity of the order of nature, and thus to elevate it above the command to use, is the declaration of an article of faith. At the time the due process doctrine was coming into the ascendancy and Lurton's opinion is pitched in the key of invoking its sanction to halt an inroad upon property.

²⁷ Taft moved on into a distinguished executive career culminating in the Presidency. In that office he appointed his old colleague Lurton to the Supreme Court, who in *Henry v. A. B. Dick Co.*, 224 U. S. 1 (1912), recited from that high bench his theory of the patent as plenary property. Later Taft himself became Chief Justice and more than an echo of the logic of the *Button Fastener* case is to be discovered in his opinion in *U. S. v. General Electric Co.*, 272 U. S. 476 (1926). See pp. 80-82, below.

of the body who could say the ultimate word. Although there was a dozen years to wait, an almost identical issue was brought before the Supreme Court in "the second paper bag" case.²⁸ The bench, by the hand of Mr. Justice McKenna and in a slightly different key, gave its consent in writing to the act of suppression. It was evident that the patentee could preserve the exclusive character of his grant only through power to prevent its invasion. It followed that the owner of an unused patent was entitled to an injunction against the invader. The court, however, could not be quite forthright about it, and in a mood of peradventure accorded a bow to the common good. As its spokesman put it, "whether, however, a case cannot arise regarding the situation of the parties in view of the public interest, a court of equity might be justified in withholding relief by injunction, we do not now decide." But McKenna did not detail the circumstances which might require a different decision and imagination does not readily supply them.

An obvious qualification occurs. In the legal vocabulary conspiracy is a naughty word; at sight of it verbal distinctions are touched off. The owner of a patent—whether inventor, assignee, or vicar by license—may suppress his creation; but he must not conspire with others to do so. The liberty of contract has by the courts been accorded the widest of orbits. But in the *Yale and Towne Co. case*,²⁹ it is set down as an incident to, rather than an essential of, the exclusive right of which the Constitution speaks. As a thing apart—a bargain between two or more parties to keep a novelty out of use—it is neither consistent nor inconsistent with the rule of property by which non-use is justified. In so nebulous a state the obligation of contract cannot cling to the Government's grant for support. It was thus, stripped of sanctions, left exposed to attack under the Sherman Act as a restraint of trade.³⁰

In these and kindred cases the Court has stopped short of grips with reality. By it the right to suppress an invention has been upheld,³¹ favorably commented upon,³² and acknowledged by omission.³³ Here is enough of judicial authority to be dubbed a doctrine and to call an industrial usage into play. A mere 9 patents are employed in the construction of the ordinary electric lamp; less than 40 are called into play in producing the most complicated lighting apparatus. Yet General Electric grounds its licenses upon a recitation of more than 300 separate grants. Many inventions are accorded the imprimatur of the Patent Office, yet few are put to work. The basic processes are no longer subject to legal protection; and these, with improvements of which no use is made, are quite enough to fit out with an adequate technology firms which might enter the industry. But free enterprise halts before the dominant patent position held by General Electric; the threat of infringement suits deters the independent from the venture.

A position alike strategic and anomalous is held by the United Shoe Machinery Co. The element of sheer creation has long ago

²⁸ *Continental Paper Bag Co. v. Eastern Paper Bag Co.*, 210 U. S. 405 (1908).

²⁹ *Yale and Towne Lock Co. v. Blount Mfg. Co.*, 166 Fed. 55 (1909).

³⁰ The holding touches off a number of issues. If by contract a single party acquires a number of patents in order to suppress, is the purchase illegal? The act of suppression? What part does intent play? If demanded, how is it to be proved?

³¹ *The Paper Bag Patents case*, *supra*.

³² *Bement v. Harrow*, 186 U. S. 70 (1902), p. 90, accepting the statement of the *Buttton Fastener case* as law.

³³ *U. S. v. General Electric*, 272 U. S. 476 (1926).

faded from its technical processes. The art of the super-cobbler, however, still maintains its pristine freshness in more than 6,000 patents. The concern is no kindly General Electric which throws crumbs from its huge loaf to the little fellow. Its system of police, with suits against competitors and against all their customers, is eternally vigilant. It allows no break in the wall it has erected about the market for shoe machinery. Just now United is pushing an action for contributory infringement against the Wilson Co. of Ohio, a domestic shoe manufacturer. It alleges that a heeling machine employed by the independent infringes the McFeely Patent No. 2 which it owns. The mechanism in question is manufactured by the Moenus Co. of Frankfurt, Germany, one of its few competitors in the world, and is based upon the principles of McFeely Patent No. 1 now expired. So slight, however, have been the changes in No. 2, that the original design has virtually been repatented.³⁴ The slight modifications have been deemed grave enough to warrant an action by United.

Instances such as these can be endlessly and engagingly recited. They display not only a host of techniques not allowed to come into use, but likewise industrial arts fenced off against trespass. As a stimulus to the advance of technology, the competition between firms is short-circuited. Invention is made to wait upon such incentives as come into play in the maintenance of a corporate estate. When in 1910 United Shoe acquired the Plant patents, it exacted an agreement sterilizing Plant's capacity for invention and forcing him to abandon the field of shoe machinery. Its current position rests upon similar agreements with other inventors whose contrivances it has taken over. A modest indulgence in improvement has an adequate complement in the rigorous use of the infringement suit; it can stay at the head of the procession without having to respond to the urge toward creation. The maintenance of the status quo prompts it to strike down inventive talent which rears its head elsewhere. As United used its patents to vest its interest, it imposed a taboo upon the incentive to invent.³⁵

As the corporation acquires its closed domain, the individual inventor is frozen out.³⁶ The law conceives of an industrial art as an accumulation of techniques. Each step is based upon the last, each step invites the next step. The monopoly of the domain, within which invention is supposed to be made, not only delays novelties and arrests the rate of advance, but it may, in part or even as a whole, create a situation hostile to new ideas and throw a barrier across the development of a technology.³⁷ The use of frequency modulation, in spite of

³⁴ Compare this situation with that disclosed in *Bassick v. Hollingshead*, 298 U. S. 415 (1936).

³⁵ For the series of steps through which an instrument has asserted its independence of policy, note *Mitchell v. Hawley*, *supra*; the *Button Fastener* case, *supra*; *Bement v. Harrow*, *supra*; *U. S. v. General Electric*, *supra*; and most recently—though the case is a little off its time beat—*General Talking Pictures v. Western Electric Co.*, 304 U. S. 175, 305 U. S. 124 (1938).

³⁶ Only one major improvement has been made in shoe machinery in the past 20 years; and the so-called Compo cementing machine emerges in another corporate domain. With a patented cement it makes possible an effective competition with the older sewing machines. Yet, without the protection of the Dupont interests the Compo machine could not remain on the market.

³⁷ Now and again courts have recognized, though usually in an aside, that an accumulation of grants may be a barrier to the furtherance of trade, especially when a portion of the holdings may represent something less than a valid claim. In *Pope Mfg. Company v. Gormally*, 144 U. S. 224 (1892), Mr. Justice Brown, by way of dictum, stated (p. 234): "It is as important to the public that competition should not be repressed by worthless patents, as that the patentee of a really valuable invention should be protected in his monopoly."

its revolutionary contribution, has had the hardest sort of going. It has been at the mercy of large chains, whose radio broadcasting has been established upon an inferior technology. Television has been so closely controlled by the radio interests that in recent years its progress has lagged far behind its experimental decade.³⁸

All of this stands out sharply in retrospect. The bother is that it was not before the Court when its ruling was made. An act of suppression does not wear an innate moral or legal quality. It may be legitimate, devoid of ethical character, a menace to the public interest. It all depends—and the content of that it is the duty of the judiciary to explore. There is a zone where non-use is fully justified. A number of inventions, with little to choose among them, lead to the same result. Not all can be put to work; if a birth control thins their ranks, it is to keep the more virile alive. There is a domain where legal justification can be driven only with the greatest difficulty. The record and the film exhibit rather different techniques; the mazda bulb and the fluorescent lamp proceed from distinct scientific bases. A rivalry between competing processes provides the environment most favorable to the progress of the art. Between lies a province where justification poses a conflict of values. Grants held by rivals are a menace to a corporate venture; it is cheaper to purchase and put on the shelf than to seek validation of the technology in use through a series of interminable law suits. In such a situation the principle of business conduct is perfectly clear; the holding which justifies it is of the most dubious legal value.

In their approach to suppression the courts have exhibited a naïveté quite uncharacteristic of their deliberations. The genius of the law lies in the detail which it brings to its designs. As case follows case, its way is slowly, almost painfully, to prick out the lines. The rule grows out of the instances and is refashioned by them. It is foliated into a series of statements adequate to the variety of situations to which it must be applied. An edifice of holdings attests the accommodation of contract to the spectrum of circumstance of which the bench readily takes notice. In an established subject like property, equities—each of which is pent within finite limits—form a veritable hierarchy. The whole body of doctrine places a caveat upon the abstract and the universal; its essence lies in its meaning in the instance. In industry and in public policy there is no such thing as suppression-in-general. For courts to deal with it as a single, indivisible entity is to rule on a level on which the problems do not lie. Where the call is for a discriminating attack—a process to which the law is habituated—it is met by the single rule that a man can do as he will with his own. And “his own” in such a rule has no analogy in the law of real property; its like can be found only in the absolute which in its heyday dominated the due process clause.

The pedigree of the rule will not bear too strict a scrutiny. It does not stem from the sanctions upon which the patent system is built. It makes no use of the norm of reference provided by the Constitution; it overlooks the instrumental character of the Government's grant. No warrant for it is set down in the patent statute, and there is no provision there from which it may be deduced without the aid of a very involved dialectic. It has no support in earlier judgments;

³⁸ Frank C. Waldrop and Joseph Borkin, *Television: A Struggle for Power*, Wm. Morrow & Co., New York (1938).

on the contrary it rides in the face of the precedents. It moves on the level of the universal to which the law of real property hardly aspires. It is not engendered by the contact of principles with an emerging actuality. As announced by Lurton³⁹ and justified by McKenna,⁴⁰ its root seems to be a rather primitive norm of ownership which somehow has escaped into a more sophisticated age. But its line of descent is broken, and it stands out in sharp contrast to its legal setting—a monument to the failure of the Court to entertain an issue upon the plane of function and reality.

As a landmark of the law, one could wish for it deeper roots and a more legitimate origin. The law is never at its best when its rule is set down before the facts are in, before the issues are laid bare, before the what-difference-it-makes is explored. The rule has become a tool of business enterprise, a weapon with which to guard the frontiers of the corporate estate. It has helped to free invention from service to the developing industrial arts. It invites a situation in which paths of inquiry can be blocked and inventions-which-might-be choked off before they are made. It has become the premise of other legal doctrines by which the Government's grant is more firmly bound to the pursuit of gain. As a man becomes free to do as he would with his own, invention can promote the progress of the useful arts only as it served the cause of monopoly.⁴¹

IMMUNITY BY CONTAGION

In the law a doctrine does not live alone; like all things of earth, it begets other doctrines after its own kind. Use and nonuse seem to be poles apart; yet the liberty to withhold a thing from use has been invoked to justify the imposition of conditions upon its employment. It is set down, in the name of logic, that the whole comprehends the part, that the greater includes the lesser. It is copied out of the reports that the patentee possesses the liberty to withhold his invention. It is, accordingly, said to follow—as if the matter were sheer mathematics—that the owner may release device or process upon his own terms. Again and again lawyers have urged;⁴² again and again jurists have accepted this most plausible of all non sequiturs.⁴³ The corpus of patent decisions is replete with attempts to give validity to this dubious "therefore." As it becomes dominant or recessive, the privileges conferred by the Government's grant are enlarged or contracted. Right to suppress is commuted into a right to restrict.

An invention never goes it alone. As it is put to work an assortment of materials and supplies, of processes and techniques get harnessed to it. The novelty is patented; the articles and accessories used with it may or may not be protected by the law against trespass. A concern which is intent upon securing the highest possible return from its patent, does not overlook the possibilities of profits in these correlative goods. If both are patented, he can establish a single closed

³⁹ *Heaton Peninsula Button Fastener Co. v. Eureka Specialty Co.* supra.

⁴⁰ *Paper Bag Patents case*, supra.

⁴¹ Note that in the cases in which the rule is laid down, the argument begs the question. The real issue is the definition of one's own; but neither Lurton nor McKenna attempts definition. Each by assumption endows it with a fullness of meaning adequate to the result.

⁴² This is the argument in *Bement v. Harrow*, supra, pp. 294, 295. The march of the argument is not neatly categorized but broad premises are clear.

⁴³ The *Button-Fastener case*, supra; *Bement v. Harrow*, supra; *United States v. United Shoe Machinery Co.*, 247 U. S. 32 (1917); *United States v. General Electric Co.*, supra.

market about machine and materials. If the patentee can specify himself as the sole source for non-patented articles, he can establish an exclusive market in articles which enjoy no legal protection. He asserts his authority through the license to make or use his machine; and to his compulsion his customer will not submit without a struggle. The patentee claimed to be monarch of all he surveyed, and his own survey extended to all that his grant could be made to touch. It was directed to unpatented goods and services employed in keeping his invention in operation; to unpatented goods produced by the patented machine; to unpatented goods created through a combination of patented mechanisms.⁴⁴ In respect to first category there has emerged a considerable body of holdings; in respect to the other two, judicial inquiry has been scant and halting.

The *Albany Paper* case was the first to test the patentee's control over unpatented goods.⁴⁵ The Albany concern held patents to a paper ejecting device. The machine was sold to purchasers of the Albany paper roll, which had been designed for use with the patented machine. No licenses were issued by the Albany company and no restrictive covenants were imposed upon the vendees in respect to the use of the ejecting mechanism. The Morgan company contrived a roll suitable for use with the device and became an alternate source of supply to owners of machines. The Albany company sued for contributory infringement.⁴⁶ In holding against the plaintiff, Mr. Justice Brown invoked a simple norm of contract. In parting with the use of his machine the patentee had value received; in consideration he gave up the right further to restrict its utilization. The only question left was whether the replacement of an unpatented roll in a patented device constituted restoration or reconstruction. The roll, it was true, was an indispensable part of the machine in operation: the paper and the apparatus of ejection might, as a single mechanism, be subject to a combination patent. Yet, upon the facts, there was not here the kind of thing which the courts had called re-creation. Upon the basis of authority, the spokesman for the Court pronounced the Morgan company free of contributory infringement.⁴⁷

Although the spokesman for the Court holds his argument to its path, he cannot refrain from an aside. The contrary holding would accord the patentee the benefit of a patent upon an unpatented article. Such a result, he insists, was never contemplated by Congress; nor was it to be condoned through resort to the necromancy of dialectic. And some 3 years later, in the *Folding Bed* case,⁴⁸ the rationale of his decision was underlined.⁴⁹ Here it was held that there was no

⁴⁴ The doctrine of replacement or reconstruction—pp. 55-56, *supra*—has been a handy weapon for the courts when confronted by these problems. If the use of unpatented materials in a process amounted substantially to a duplication of the patented combination, a pretty problem arose. The exclusive right to make, no more than the exclusive right to use, gives ground for controlling the use of unpatented materials.

⁴⁵ *Albany Paper Co. v. Morgan Envelope Co.*, 152 U. S. 425 (1893).

⁴⁶ It rested its argument heavily upon *Cotton Tie Co. v. Simmons*, *supra*, which had held re-creation so as to duplicate a patented mechanism an invasion of the exclusive right to make.

⁴⁷ The activity fell clearly without the category of re-creation; hence the *Cotton Tie* case was not in point. *Wilson v. Simpson* was the Court's chief reliance; *Bloomer v. McQueen* and *Adams v. Burke* were also cited.

⁴⁸ *Keeler v. Standard Folding Bed Co.*, 157 U. S. 659 (1895). Mr. Justice Brown, progenitor of the Albany Paper Co. doctrine, was unable to follow this extension of his own position. With him in dissent joined Chief Justice Fuller and Mr. Justice Field. The absolute conveyance of the patented mechanism is the common denominator of the Albany decision and the Keeler holding.

⁴⁹ The judgment anticipated the line of decisions which hit hard at resale price maintenance: *Bauer v. O'Donnell*, 229 U. S. 1 (1912); *Straus v. Victor Talking Machine Co.*, 243 U. S. 490 (1917); *Boston Store v. American Gramophone Co.*, 246 U. S. 8 (1917). See pp. 73-74 below.

intent "to deprive a patentee of his just rights," because "no article can be unfettered from the claim of his monopoly without paying its tribute." But the Court was of opinion that "one who buys patented articles of manufacture from one authorized to sell them becomes possessed of an absolute property in such articles, unrestricted in time and place." And it concluded that the "inconvenience and annoyance to the public" which an opposite result would occasion "are too obvious to require illustration."⁵⁰

At this point the *Button Fastener case*,⁵¹ obtrudes brusquely to interrupt the even tenor of a doctrine on its way. In the situation presented to the Court, the machine was patented, the materials employed in its operation subject to no legal protection, the purchaser bound by license to use exclusively the staples furnished by the vendor. A competing concern, which was pressing the sales of its own materials, was by Judge Lurton and his colleagues held guilty of contributory infringement. The opinion tacitly accepted the authority of Mr. Justice Clifford,⁵² and was carried along by the novel doctrine of "liberty of contract" which was just then elbowing its way into the due process clause.⁵³ The embarrassment of the Albany decision was removed by distinction; the Keeler opinion, with its impulse to throw the instant ruling into reverse, was put to one side. The learned judge was not immune to the consideration of policy; but the policy with which his mind was filled was the capacity of the business community to regulate its own affairs. That a patent was an instrument of government to be held within its ambit did not obtrude deeply into a judicial commitment to laissez-faire. It was to him enough that "high considerations of public policy are involved in the recognition of a wide liberty in the making of contracts."⁵⁴

Once off to its start, the doctrine of liberty of contract for the patentee easily gained momentum. To a lay mind it might seem to clash with the doctrine drawn by Brown from the law of property, that seller transferred to buyer an unclouded title. But the conflict between holdings drawn from kindred branches of the general law did not seriously disturb the resourceful jurist. In the *Leeds and Catlin case*⁵⁵ Mr. Justice McKenna showed how freedom in imposing terms upon the vendee was in strict accord with the Court's former utterances. By inventing a distinction between "active" and "passive" elements in a patented combination, he tossed the Albany doctrine to one side. The record disks supplied by Leeds and Catlin were active elements in the operation of the Victor phonograph; the paper supplied

⁵⁰ Note a rhetoric employed by Mr. Justice Shiras in which absolute is set against absolute. In such a clash the only way of resolution is to limit each to its proper province. In such an endeavor perplexing questions are bound to arise. For instance, "whether a patentee may protect himself and his assignees by special contracts brought home to the purchasers, is not a question before us, and upon which we express no opinion. It is obvious, however, that such a question would arise as a question of contract, and not as one under the inherent meaning and effect of the patent laws." *Ibid.*, at p. 666. In other words, such a restriction must stand or fall by the law of contract; the sanction of the patent cannot be invoked to help it toward validity.

⁵¹ *Heaton-Peninsula Button Fastener Co. v. Eurcka Specialty Co.*, supra.

⁵² *Mitchell v. Hawley*, supra.

⁵³ See "The Path of Due Process" in *The Constitution Reconsidered*, edited by Conyers Reed (1938).

⁵⁴ *Button-Fastener case*, supra, p. 294: "In considering any question in respect of restraints upon the liberty of contracting, imposed by principles of public policy, we should bear in mind that very high considerations of public policy are involved in the recognition of a wide liberty in the making of contracts" (citing with approval the statement of Sir George Jessell in *Registering Company v. Sampson*, L. R. 19 Eq. 462, 465).

"Especially is this (Jessell's) caution applicable when we sit in judgment upon the limitations which a patentee may put upon the use of his invention."

⁵⁵ *Leeds and Catlin v. Victor Talking Machine Co.*, 213 U. S. 325 (1909).

by the Morgan Co. was a passive article. Activity, rather than a patent, was—at least for the instant case—the thing. The Court added that the unpatented state of the records did not bring the matter within the orbit of public policy or in any way affect the decision.

In due course Judge Lurton became Mr. Justice Lurton. To the United States Supreme Court he brought his rationale upon the patent license; and almost at once he had an opportunity to recite it from the high bench.⁵⁶ The Dick Co., a manufacturer of patented duplicating machines, tempered its sales with qualifying conditions. By a notice attached to the instrument it stipulated that the purchaser took title subject to the restriction that it "may be used only with stencil, paper, ink, and other supplies manufactured by the A. B. Dick Co." Henry manufactured a special ink which he marketed through the regular channels of trade, and which could be and was used with the patented machine. In a logic which tolerated neither alternative nor peradventure, the learned jurist declared that "if the right of use be confined by a special restriction, the use not permitted is necessarily reserved to the patentee." It followed that "if that reserved control of the use of the machine be violated, the patent is thereby invalid." At this point a qualm obtruded and was dismissed with the line, "This right is deducible from the nature of the patent monopoly." But the monopoly—note the selection of an absolute as the question-begging word—can stand a little support from authority. And to show that it "is recognized in the cases," Lurton regiments to his holding the whole array of previous judgments. In a word, intent and notice are sufficient in themselves to define what a patentee gives up—and what he retains—in the sale of his machine.⁵⁷

Such a post was too advanced to be held. That a patent was a monopoly; that its owner could release it and still hold whatever equities in it he chose; that his control endured after his machine had gone out into the wide world and had been caught up into the usages of a going economy was on its face a little extreme. Its departure from reality could not long withstand a corroding demand for qualification. In the very year of *Henry v. Dick*, the Court was compelled to make a strategic retreat. In the *Bath-tub case*,⁵⁸ contracts grounded in patent rights were employed to dominate the trade practices of enamel ware manufacturers. The issue had general significance; for the association in the building trades was intent upon affecting a brotherly accord among its members—yet keeping clear of the anti-trust laws.

⁵⁶ *Henry v. A. B. Dick and Co.*, 224 U. S. 1 (1912).

⁵⁷ It is in order to recite in the margin the cases in the lower courts which follow the decisions in "Button Fastener" and "Dick" and hold that it is permissible for a patentee to control the materials and supplies employed in the operation of his machine:

Commercial Acetylene Co. v. Autolux Co., 181 Fed. Rep. 387; *U. S. Fire Escape Counterbalance Co. v. Joseph Halsted Co.*, 195 Fed. Rep. 295; *United States v. Winslow*, 195 Fed. Rep. 578; *Consolidated Rubber Tire Co. v. Republic Rubber Co.*, 195 Fed. Rep. 768; *Parsons Nonskid Company Limited, et al. v. McKinnon Chain Company*, 196 Fed. Rep. 218; *Lovell-McConnell Mfg. Co. v. Waite Auto Supply Co.*, 198 Fed. Rep. 139; *Winchester Repeating Arms Co. v. Buengar, et al.*, 199 Fed. Rep. 786; *Crown Cork & Seal Co. v. Brooklyn Bottle Stopper Co.*, 200 Fed. Rep. 592; *American Graphophone Co. v. Pickard*, 201 Fed. Rep. 546; *Waltham Watch Co. v. Keene*, 202 Fed. Rep. 225; *Winchester Repeating Arms Co. v. Olmstead*, 203 Fed. Rep. 493; *Robert H. Ingersoll & Bro. v. M'Coll*, 204 Fed. Rep. 147. See also: *Cortelyou v. Lowe*, 111 Fed. Rep. 1005; *Cortelyou v. Lowe*, 114 Fed. Rep. 1021; *Cortelyou v. Carter's Ink Co.*, 118 Fed. Rep. 1022; *Broderick Copygraph Co. v. Roper*, 124 Fed. Rep. 1019; *Mayhew v. Broderick Copygraph Co.*, 137 Fed. Rep. 596; *Broderick v. Mayhew*, 131 Fed. Rep. 92; *Cortelyou v. Johnson*, 138 Fed. Rep. 110; and *Cortelyou v. Johnson*, 145 Fed. Rep. 933.

⁵⁸ *Standard Sanitary Mfg. Co. v. U. S.*, 226 U. S. 20 (1912). The cross-licensing aspects of the case, engaging as they are, are not in point here.

The incident served to sharpen the eyes of the Court to the industrial scene. The spirit of cooperation brooded over the whole affair and judges were tempted to whisper "conspiracy." In speaking for the Court, Mr Justice McKenna made a polite bow to the holding in the *Dick case*, then proceeded to eliminate the tenets upon which that decision rested. Freedom of contract is limited to what is "necessary to protect the use of the patent or the monopoly which the law conferred upon it." It is true that "rights conferred by patents are very definite and extensive." But no more than other rights did they give "an universal license against positive prohibitions." The agreements in question clearly "transcended" the need for protection; they "passed to the purpose and accomplished a restraint of trade." They crossed the line of judicial tolerance, for "the Sherman law is a limitation of rights, rights which may be pushed to evil consequences."

The shifting attitude is even more manifest in the *Motion Picture Patents case* decided 5 years later.⁵⁹ Although the supplies in legal questions were negatives—and hence active elements in the operation of the projecting machines—the doctrine of *Leeds v. Catlin* was accorded a silent repose. Instead the holdings which Lurton had rejected or conjured away now became the head of the legal column. Not content with this, Mr. Justice Day, the spokesman for the Court, did a little probing of his own toward fundamentals. "The exclusive right granted in every patent must be limited to the invention described in the claims." It is "not competent" for the owner to "extend the scope of the patent monopoly." The law accords him no power to restrict "the use of it to materials" which, although "necessary to its operation" are "no part of the patented invention." Such practice finds "no warrant in the patent law." And, in words which have a familiar ring, he concludes "the cost, inconvenience, and annoyance⁶⁰ to the public which the opposite conclusion would occasion forbid it."

But situations are never alike; issues are created by the strategy of advocates; the clash of values against the industrial back-drop presents no single and recurring picture. It was too early for the doctrine thus announced to come to rest. The relapse came with the *United Shoe Machinery case*.⁶¹ The United produced a complete line of shoe machinery; every operation in the whole technical process was covered by a patent. The machines were never sold outright but leased to manufacturers of shoes upon a royalty basis. In the contracts were restrictive clauses, the most important of which forbade lessees to use the machines "in the manufacture or preparation of footwear which has not had certain essential operations performed upon it by the other machines leased from the lessor." Mr. Justice McKenna, who wrote the opinion of the Court, gave full currency to the distinction between sale and lease, discovered scant resemblance between the arrangements in *Standard Sanitary* and those in question here, and allowed United to do as they would with machines still in their legal possession. The "tying contracts" were to him bargains quite of a kind with those which men ordinarily make in putting property to use.

A critical study shows the holding to rest upon insecure foundations. The suit was instituted by the Attorney General against the written

⁵⁹ *Motion Picture Patent Co. v. Universal Film Co.*, 243 U. S. 502 (1917).

⁶⁰ Compare *Albany Paper Co. v. Morgan Envelope Co.*, supra; *Keeler v. Standard Folding Bed Co.*, supra.

⁶¹ *United Shoe Machinery Co. v. U. S.*, supra.

objection of the President.⁶² In the preparation of the case the Government was hampered from within. A conflict over strategy attends the course of the litigation; the action is replete with moves which properly are no part of the process of litigation. Upon the appeal the Solicitor General, ignorant of the industry and confused on issues, conceded where he should most valiantly have contended. Pressed from the bench and unacquainted with the record, he admitted that the patents gathered under the auspices of the corporation were complementary and not competitive.⁶³ As luck would have it, the issues had to be argued before a bench of seven and the decision turned upon a single vote. The judgment had the support of less than a majority of the full bench.⁶⁴ In respect to the issues of law, the evidence indicates that the two who did not sit would have voted with the dissenters to form a majority of the Court. Views came to be set down as official when five out of nine were unwilling to go along.

Thus intrudes the adventitious to deflect the law from its course.⁶⁵ A sheaf of questions which the decision might have put to rest still await settlement.⁶⁶ If, within the confines of the case, the law is to be found, it doubtless appears in the dissenting opinion of Mr. Justice Day. "There is embraced in the patent grant the right or privilege to make licenses and agreements covering the use of the machines patented so long as such agreements are not in themselves unlawful." But "the right or the privilege"—note the implication in the shift of terms—⁶⁷ "to make restrictions is controlled by the general principles of law." Hence the patentee "may not make contracts in themselves illegal"; he is "certainly" not "authorized to make contracts in violation of other statutes of the United States." In a word, the authority

⁶² At the time William Howard Taft was President; George W. Wickersham, Attorney General.

⁶³ An unpublished manuscript by Irene Till, "The Strange History of the United Shoe Machinery Cases" subjects the course of litigation to critical review.

⁶⁴ Neither Mr. Justice McReynolds nor Mr. Justice Brandeis sat. McReynolds had been Attorney General during the pendency of the suit. Brandeis had once been attorney for United and had thrown up his retainer because of the unethical practices of the company.

⁶⁵ The patent policy of United was a prompter of sec. 3 of the Clayton Act. This visits the law's condemnation upon attempts to control patented or unpatented goods, wares, machines, or devices used in connection with a patented mechanism which has been leased or sold. The case discussed here arose under the Sherman Act, but in a later case brought under the Clayton Act the tying agreements sustained here were struck down. *United Shoe Machinery Co. v. United States*, 258 U. S. 451 (1922).

A series of cases arising under this section, have in various ways limited the remote control of the patentee over his product. Note *International Business Machines Corp. v. United States*, 298 U. S. 131 (1936); *Standard Fashion Co. v. Magrane Houston Co.*, 258 U. S. 346 (1922); *Oxford Varnish Corp. v. Alt and Wiborg Corp.* 83 F. (2d) 764 (1936); *Stanley Co. v. American Tel. and Tel. Co.*, 4 F. Supp. 80 (1933). For holdings more or less out of accord with the general prohibition on "tying agreements" see *Leavell Butter Co. v. Federal Trade Commission*, 292 Fed. 720 (1933); *Pick Mfg. Co. v. General Motors Corp.*, 80 F. (2d) 641 (1935); *Sinclair Refining Co. v. Federal Trade Commission*, 276 Fed. 686, affirmed 261 U. S. 463 (1923); *Vulcan Manufacturing Co. v. Maytag Washer Co.*, 73 F. (2d) 136 (1934).

⁶⁶ Sec. 3 of the Clayton Act is used as a corroborative support of the judgment in the *Motion Picture Patents case*. But, so far as search reveals, their words have never been applied to restrictive licensing arrangements. Under the general law of property a lease is usually a larger interest than a license and *a fortiori* the lessor would seem to be subsumed in the congressional mandate. The failure to apply the doctrine seems to be due to the character of the interest; rather than to any distinction between lease and license. Sec. 3 refers to tangible objects, whereas licensing is directed primarily to relationships, obligations, and like intangibles. In both the *Motion Picture Patents case* and *Lord v. Radio Corporation of America*, 24 F. (2d) 565 (1928), the words "lease" and "license" are used interchangeably.

⁶⁷ The term "right" in the Constitution is not that of the constitutional lawyer of a century and a quarter later. There were lawyers in plenty, but almost no legalists, among the fathers. The word is used in a broad sense as befits the document. It antedates the sharp separation between right and privilege; and since it comes by grant from the state, more nearly approximates the latter than the former. At the time it was coming to be used for liberty in the ancient sense, as, for example, a man's liberty to perform an act, exact a fine, claim a due. Another word was necessary, since liberty was then on its way toward the abstraction we now know.

conferred by letters patent is under the general law and comes up sharp at the frontier of the Sherman Act.⁶⁸

The immediate future belonged to the dissent rather than to the opinion which was set down as that of the Court. As the years passed a sharper perspective came. The Constitution had imposed upon Mr. Justice Holmes no mental statics, and gradually the perquisites of property gave way to considerations of policy in his attitude. Although in *Motion Picture Patents* he had dissented and in *United Shoe Machinery* had been with the nominal majority, he spoke for his Court and to an opposite result in *Heyer v. Duplicator*.⁶⁹ Heyer was the manufacturer of gelatin bands suitable for employment in the machines of the Duplicator Co. His legal adversary, shrewd to fortify his legal position, had taken out a combination patent on bands and machines. The grant was reflected in a license agreement which bound the products together in use. Holmes escapes the *Leeds and Catlin* judgment; there a right to insert new and separate elements in a patented mechanism was in question; here the issue concerns no more than the right to replace worn-out parts. This matter accomplished, it is easy to fall back upon the venerable case of *Wilson v. Simpson* for authority. And with an agile pen to attend him upon the way, the rest of the going he finds easy. As his strokes come into place the distinction between *Albany Paper* and *Leeds and Catlin* is obliterated and tacitly he accepts the decision in *Motion Picture Patents* against which he had rebelled.⁷⁰

It is, however, far easier for the Supreme Court to lay down the law than it is for the lower courts to follow it. Cases, like characters in a play, possess their personal identities; each in background, situation, arrangement, issue presents something distinctly its own. Every resort to law involves specific motions before the Court. Currents of opinion from above always encounter obstacles and as often as not the rate of their descent is unhurried. In spite of *Motion Picture Patents* reinforced by *Duplicator*, a number of Federal judges continued to uphold restrictive agreements grounded upon patents. The adroit legalism, by which deference was shown to the words of opinions from above yet their spirit was flaunted, present a superb exhibit in logomachy. A statement of law, concerned with an intricate matter of technology, does not invite judicial opinion devoid of the possibility of misunderstanding. Parties who were willing to hazard litigation could always find lawyers who would construe former holdings to accord with their desires.⁷¹ Even where an adverse result was to be found, many patentees continued to impose the tying clause in the hope that their superior bargaining position would dissuade rivals from risking the expense of an appeal to the courts.

⁶⁸ "That rights granted under a patent do not authorize the making of contracts in restraint of trade, or monopolizing, or tending to monopolize trade and commerce in violation of the Sherman Act was held by this Court in *Standard Sanitary Manufacturing Co. v. United States*, 226 U. S. 20." Mr. Justice Day, dissenting, *ibid.*, at p. 74. There is little doubt that the two justices who did not sit would have concurred in the statements quoted here in text and footnote.

⁶⁹ *Heyer v. Duplicator Mfg. Co.*, 263 U. S. 100 (1923).

⁷⁰ Holmes wrote a dissent in *Motion Picture Patents*, in which he made out a rather better case for the holdings in *A. B. Dick and Co. v. Henry and Heaton Peninsula Bulton Fanner Co. v. Eureka Specialty Co.* than their author had done.

⁷¹ For examples of the art by which holdings can be made to serve an alien cause, see *Westinghouse Electric and Manufacturing Co. v. Diamond State Fibre Co.*, 268 Fed. 121 (1920), and the lower court decisions in the *Carbice*, *infra*, and the *Leitch*, *infra*, cases.

In respect to the unpatented products of a patented process,⁷² there are hardly enough holdings to support a line of law in the text. In recent cases the Court has set down broad grounds of policy which would seem severely to limit the manufacturer's right. In the *Motion Picture Patents case*, it was stated that the "patentee is restricted in the use of the invention as it is described in the claims of his patent."⁷³ Such use would not contemplate apparently the control of an unpatented product which results from the application of the patented invention, but only that control which is directed to the mechanism itself. And in the recent *Philad case*, a circuit court objected sharply to a method of doing business by which a patent was used as if it covered unpatented articles.⁷⁴ To the contrary the right of the patentee to control the incidences which ordinarily attend the sale of a manufactured ware, at least if it emerges from a combination of patented elements, still has the support of the *General Electric case*.⁷⁵ Against this clash of rationales may be set down three recent judgments. The owner of a brick-transporting machine may not impose quotas and resale prices upon the bricks which emerge from his process of manufacture; the decision treats the patented device as though it were a patented process.⁷⁶ A manufacturer may establish resale prices upon unpatented baskets which are the product of a patented basket-making machine.⁷⁷ It is conceded, for the purpose of the suit, that "restrictive covenants may include a commodity which, though not covered by a patent, is a product of a patented process."⁷⁸ What currently is the law can hardly be spelled out from such vagrant holdings as these. At the moment the unpatented ware is in quest of its freedom.

In the last decade the decisions of the Supreme Court have left little doubt about the general trend of the law. The holdings in *Standard Sanitary* and *Motion Pictures Patents* are in the ascendancy and the propositions they contain circulate at something like face value. A trio of recent judgments have made firm their foundations, filled in their omissions and fortified their authority.⁷⁹ It now appears to be settled that the patentee may no longer dictate in respect to accessories to be employed in the operation of his machine. His power over the unpatented product of his patented process is in serious lega

⁷² As early as 1846, however, it was decided that an assignment of an exclusive right to make and use, and to vend to others within a given territory only, "did not apply to the vending" out of the said territory (of) the planks, boards, and other materials, the product of the (patented) machines." *Simpson et al. v. Wilson*, 4 How. 709. Mr. Justice Nelson delivered the opinion. Nelson stated further that "the Court have no doubt * * * that the restriction in the assignment is to be construed as applying solely to the using of the machine. There is no restriction, as to place, of the sale of the product."

⁷³ *Motion Picture Patents case*, op. cit., supra, 515.

⁷⁴ *Philad. Co. v. Lechler Laboratories, Inc.*, 107 F. (2d) 747 (C. C. A. 2d, 1939), p. 748. Reliance was placed upon the authority of the *Leitch* and the *Carbice cases* cited below. The quotation is: "In both the *Carbice case* and the *Leitch case* the emphasis was on the fact that the articles handled by the alleged contributory infringer were not covered by the patent, and on the further fact that the patentee by his method of doing business was using his patent as if it did cover such articles."

⁷⁵ *U. S. v. General Electric Co.*, 272 U. S. 476 (1926).

⁷⁶ *American Equipment Co. v. Tuthill Building Materials Co.*, 69 F. (2d) 406 (C. C. A. 7th, 1934), citing the *Motion Picture Patents case* as authority.

⁷⁷ *Straight Side Basket Corporation v. Webster Basket Co.*, 82 F. (2d) 245 (C. C. A. 2d, 1936), citing *Bement v. Harrow* and the *General Electric case*.

⁷⁸ *U. S. v. Standard Oil Co. of Indiana*, 33 F. (2d) 617, 630 (D. C. N. D. Ill. 1929).

⁷⁹ The cases are *Carbice Corporation v. American Patent Corporation*, 253 U. S. 27 (1931); *Leitch Manufacturing Co. v. Barber Co.*, 302 U. S. 458 (1938); *Ethyl Gasoline Corp. v. United States*, 309 U. S. 436 (1940). The trend in the lower courts runs the same way; see e. g., *American Lecithin Co. v. Warfield Co.*, 23 F. Supp. 326 (D. C. N. D. Ill. 1938); *J. C. Ferguson, Inc. v. American Lecithin Co.*, 94 F. (2d) 72 (C. C. A. 1st, 1938); *Philad. Co. v. Lechler Laboratories, Inc.*, supra.

jeopardy. The tying clause has ceased to be valid; the lines by which remote control is exercised seem to invite the scrutiny of the courts.

Whatever happens, no violence will be done to legal maxims. The greater right comprehends the lesser—that is if it is included within it. But if the rights are different in kind or the lesser gets tangled up with an alien thing, a respectable adage must withdraw to the sidelines. Whatever the course of judicial events, a man will continue to do as he will with his own. But, in respect to the exclusive right of the invention, his own—as against the other fellow's and the public's—is still in need of its boundary lines. Every man to his right; and, lest they collide as the whole exceeds the sum of the parts, the law must decree proper orbits.

CHAPTER V

THE GRANT AS SHIELD AND SANCTION

TOLERANCE OF REMOTE CONTROL

As a law abiding person, the corporation accords respect to a letter bearing the seal of the Government. Its habit has been to take a patent for a little more, rather than somewhat less, than the signor intended. If on occasion it has been skeptical of a document issued to another, it has more than atoned in the extravagant regard exhibited toward its own instrument. It has not allowed its privilege to atrophy; instead it has sought zealously to make the most of the exclusive right entrusted to it. It has, over the years, elaborated a simple permission into a mighty code of perquisites and immunities, clever in their conception, subtle in their justification, effective in their operation. As elements of an elaborate design, they are easy to comprehend; as an organic whole, they present a corpus of authority as formidable as it is bewildering.

If the patentee is to translate his exclusive right into dominion of an industrial province, he must be up and doing. So far as he can bring it about, his authority must replace the open market in the conduct of his business. If he can establish "consumer acceptance" for his product, a control over its price promises financial solvency and industrial security. So he decrees schedules which are to attend his product at every point at which it changes hands—and presents to the courts the question of the patent as a legal sanction for resale price maintenance. If its owner can draw a cordon around the protected process, does his authority move with the product along the marketing channel to its ultimate destination? The ruling, stemming from Nelson and Taney,¹ which limits the grant to the privilege strictly conveyed, can be invoked to deny such an authority. The right of suppression—and the inevitable lesser comprehended within the greater—can be used to uphold it. Its logic, even after its own eclipse, may continue to serve, if its doctrinal progeny are off to a hardy start. Fact, too, bends principles to its will; and unexpected situations compromise approaches, dilute rules with their contraries, and dictate intermediate positions. In the raw the issue holds enough of pull and haul to cause any doctrine to pass through a complete and disorderly cycle before coming to rest.

Although not first in its line,² the *Button Fastener* case presented the starting-point for doctrine. Upon it as groundwork was rested a

¹ *Wilson v. Rousseau*, supra; *Bloomer v. McQuewan*, supra.

² See *Fowle v. Parke*, 131 U. S. 8.8 (1889), which had said, through Mr. Chief Justice Fuller, that "relating as these contracts did to a compound involving a secret in its preparation; based as they were upon a valuable consideration, and limited to the space within which, though unlimited as to the time for which, the restraint was to operate, we

right "inherent in the patent grant" to establish for the ultimate purchaser—no matter how many transactions away—a fixed price. In a departure from *Bloomer v. McQuivan*, Judge Lurton separated the use of the machine from the machine itself. So long as the patent was valid, the title to the machine passed by sale, but an equity to determine how it was to be used remained with the owner. The purchaser of the machine, "subject to restricted use takes the structure with a license to use the invention only with staples of the patentee." That the machine is sold "through jobbers, and not directly to those who buy, is immaterial;" for the "jobber buys and sells subject to the restriction" and vendor and vendee alike "have notice of the conditional character of the sale."³

The want in such a holding is not in amplitude. For a time the *Button Fastener* case set the standard for orthodoxy; from its corpus could be drawn reasons to sustain almost any privilege claimed by the patentee. It is easy, by a kind of contagion, to carry the owner's tight grip over his invention to all goods which emerged from it or which were defined by the claims in the letters patent. The articles had passed on, to the jobber, to the wholesaler, to the retailer, into the general channels of merchandise. Yet the patentee had an equity which ran on with the chattel and the legal right to decree its price from his citadel of privilege.

Once the right to restrict was granted, the course of the doctrine was headlong. Types of remote control became mere species of a very virile genus. A long string of cases in the following decade assumed the Lurton premises, drew forth their implications, and proceeded to find resale price maintenance within the law.⁴ In the *Edison* case phonographs sold subject to restrictive covenants "governing and controlling the sale of the same," were disposed of by the Edison company without proper respect for the limiting provisions. The court, taking the path blazed by the *Button Fastener* case, found purchase by Pike, without adherence to the restrictive covenants of the vendee, an infringement of the patent.⁵ And, through a tacit acceptance of the authority of Mr. Justice Clifford, it reached the conclusion that the rights possessed by the vendee were derivative and in scope could not exceed the power which the licensee could lawfully pass on.⁶ The conditions prescribed had not been complied with; the purchaser's

are unable to perceive how they could be regarded as so unjustifiable as to justify the court in declining to follow them.

"The vendors were entitled to sell to the best advantage, and in so doing to exercise the right to preclude themselves from entering into competition between purchasers; and the purchasers were entitled to such protection as was reasonably necessary for their benefit. * * * The policy of the law is to encourage useful discoveries by securing their fruits to those who make them. If the public found the balance efficacious, they were interested in not being deprived of its use, but by whom it was sold was unimportant."

Note the hidden premises and the broad principles of freedom of contract. The last-quoted sentence also contains at least a suggestion that suppression of patents may be invalid.

³ *Heaton-Peninsula Button Fastener Co. v. Eureka Specialty Co.*, supra, pp. 290, 291. The position assumed by Judge Lurton was in result that taken by Mr. Justice Clifford in *Mitchell v. Hawley*. That Clifford's view was not so assured as Lurton's is evident in his subsequent support of the Burke doctrine.

⁴ Among representative cases are *Harrison v. Glucose Co.*, 166 Fed. 304 (1902); *Victor Talking Machine Co. v. The Fair*, 123 Fed. 424 (1903); *Dr. Miles Medical Co. v. Goldthwaite*, 133 Fed. 794 (1904); *Dr. Miles Medical Co. v. Platt*, 142 Fed. 606 (1906); *Dr. Miles Medical Co. v. Joyner Drug Co.*, 149 Fed. 838 (1906).

⁵ *Edison Phonograph Co. v. Pike*, 116 Fed. 863 (1902).

⁶ In other words, keeping a qualification upon the public interest in its place is used to justify a further qualification of the public interest.

title was invalid; his attempt to strip of conditions and convey amounted to nothing short of contributory infringement.⁷

The case of *The Fair*⁸ exhibits a kindred attempt to ground the law of patents upon an elusive concept of property. The Fair, a Chicago department store, had bought a quantity of phonographs from a jobber, who had purchased them from the manufacturer under a strict agreement, but had failed to pass along the restrictions with the goods. Nonetheless, *The Fair* was held guilty of contributory infringement in disposing of the article at a price lower than that established by the owner of the patents. The court discovered an implied notice, stated that conveyance without imposition of the license restrictions fell short of a good title, and by a slightly different journey arrived at the result reached in the *Edison case*.

Although these decisions had reputé, they were not destined to endure. A ruling which takes account of all the values which come to judgment is likely to stand. One which exaggerates certain interests and ignores those which are in opposition runs the risk of being upset. In this series there was no sudden change; rather a number of holdings on particular situations and then a discovery that the trend had been set in reverse. In a suit which concerned Peruna—a cure-all which rode into popular favor on the anti-alcohol wave—a circuit court found invalid a simple contract designed to fix the resale price of proprietary medicines.⁹ Then, in the *Bobbs-Merrill* case,¹⁰ the right of the publisher to pass along his prices with his books was struck down as an extension of copyright beyond the intent of Congress. The argument was easily shifted from copyright to trade-mark, and in the famous *Dr. Miles case*, the court declared that license and notice attached to trade-marked articles did not escape the antitrust laws.¹¹

At this point appears the *Bauer case*.¹² A drug "Santogen" was patented; the goods were passed along a vertical channel; all handlers were licensed; a covenant bound all parties to follow a price-list decreed by the manufacturer. O'Donnell, a pharmacist in the city of Washington, departed from the prescribed schedules and was sued by Bauer for infringement. The court, mindful of earlier holding and far from intent upon the button fastener, held that "a patentee who has parted with a patented machine by passing title to a purchaser has placed the article beyond the limits of the monopoly secured by the patent grant."¹³ A little later another round in the bout

⁷ In the course of its argument the Court impliedly read notice and good faith into the *Mitchell v. Hawley* doctrine. Here the purchaser had notice of the restrictions and his attempt to escape, on the theory of purchase for use—*Adams v. Burke*, op. cit.—offended the Court's sense of propriety. In essence the "good faith" is that evoked by Butler and Brandeis, JJ., in their opinions in the *General Talking Pictures* case a quarter of a century later.

⁸ *Victor Talking Machine Co. v. The Fair*, 123 Fed. 424 (1903).

⁹ *John D. Park and Sons v. Hartman*, 153 Fed. 24 (1907). Patent medicines are under some judicial suspicion. Justices are not too tolerant of attempts to profiteer in the instruments of health. It is impossible to assess more than generally the incidence of such intangibles upon decisions. See also *Jayne v. Ladner*, 148 Fed. 21 (1906).

¹⁰ *Bobbs-Merrill Co. v. Straus*, 210 U. S. 339 (1908). Straus is, of course, R. H. Macy & Co., whose war with the publishers over the retail price of books has gone through many legal battles and is still raging.

¹¹ *Dr. Miles Medical Company v. John D. Park and Sons*, 220 U. S. 373 (1911). The opinion, written by Mr. Justice Hughes, is not clear-cut. It moves by way of technicalities and much is made of the possibility that the price-cutter may not have assumed contractual obligation or have been served with proper notice. For he may have obtained his supply, not through the legitimate marketing channel controlled by the manufacturer, but along some lateral line from another dealer. Like so many of Hughes' opinions, the reasons given are far narrower than the positions taken.

¹² *Bauer et Cie v. O'Donnell*, 229 U. S. 1 (1912).

¹³ Again the Clifford doctrine becomes recessive: and again *Bloomer v. McQueenan*, *Adams v. Burke*, *Chaffee v. Boston Belting Co.*, and *Kaiser v. Sanitary Folding Bed Co.*, are reinstated as the law.

between the retailer and the publisher was staged, and the court insisted that "it cannot be successfully contended that the monopoly of a copyright" is "any more extensive than that secured under the patent law."¹⁴ A quadruple play of copyright to trade-mark to patent to copyright covers the front. The right to vend under restriction is limited to original sale; an end is put to vertical price control through patents; covenants which run with the patented good run against public policy.¹⁵

But the patentee is a hardy soul, whose courage did not falter before these judgments. If direct control went in the face of the law, circumlocution could be employed in its stead. A license agreement, through whose elaborate formalism title was not allowed to pass, might vault over judicial hazards and attain the objective.¹⁶ All who bought, passed along, or used Victor goods—no matter at what degree of remoteness from the manufacturer—were licensees, though factually the jobber was the concern's ultimate customer. Thus the individual never came into legal ownership of the phonograph in his living room or even of the records he played upon it. These were leased to him for an indeterminate period by the patentee upon condition that they were to be used together and that no product of another manufacturer obtrude. For an arrangement so conducive to music appreciation the court could find no more fit name than "evasion." It discovered on the part of the manufacturer an indulgence in a "perversion of terms" with the aim of retaining to itself benefits which pass with the alienation of property.

The prohibition was strengthened—and the way of evasion rendered more difficult—by the Boston Store decision.¹⁷ Here the manufacturer made his sales of patented products to dealers conditional upon their maintenance of resale prices to jobber customers. Their practice rested upon a gossamer network of seasoned legalisms, which the Supreme Court refused seriously to entertain. The arguments, by which the company attempted to save their plan from the condemnation which the law had visited upon schemes directed to the same end, were too fine-spun for the naked eye of the Court.¹⁸ The distinction was made to rest upon "a mere question of the form of notice of the patented article, or the right to contract solely by reference to such notice." Its subtlety in difference "disregards the fundamental ground" upon which "the decided cases must rest"; and it is therefore "devoid of merit."

Public policy had taken the saddle, venerable holdings were caught up; ¹⁹ and by 1920 it was accepted that the patentee who had bar-

¹⁴ *Straus v. American Publishers' Association*, 231 U. S. 222 (1913). Again, of course, Straus is *R. H. Macy & Co.*

¹⁵ The case of *Keeler v. Standard Folding Bed Co.*, 157 U. S. 659 (1895)—a little off the chronological beat—is worth a note in passing. The decision follows the reasoning of earlier cases and concludes that a vendee of a patentee did not infringe the rights of the patentee's assignee by selling the purchased articles in the territory "belonging" to the assignee. The case, in fact and holding, is substantially that of *Hobbie v. Jennison*, 149 U. S. 355 (1893). The Keeler holding is verbally broader than the facts warrant; but in theory it accords with the later decisions which outlaw resale price maintenance and limit the patent control over unpatented goods and services. The meaning and trend of the opinion are given perspective by the dissent of Mr. Justice Brown, the creator of the doctrine of the *Albany Paper Co. case*.

¹⁶ *Straus v. Victor Talking Machine Co.*, 243 U. S. 480 (1917). McKenna, Holmes, and Van Devanter, Justices, dissented.

¹⁷ *Boston Store v. American Gramophone Co.*, 246 U. S. 8 (1917).

¹⁸ Note particularly *Baker v. O'Donnell*, and *Victor Talking Machine Co. v. Straus*, *supra*.

¹⁹ *Supra*. Note the breadth restored, at least for the moment, to the patent grant by the decisions in the *General Talking Pictures* cases.

tered away his chattel had allowed its price to pass beyond his control. It also appeared clear that the use of legal prestidigitation to circumvent the Court's holding was waste motion. A neat trick in respect to contract, posted notice, license agreement, jobber arrangement was all right if without legal resort it could be made to work; but the courts were not to be expected to lend their sanctions to its enforcement. The law, with strict impartiality, might keep away from the issue; but it could not be invoked to secure to the owner of a grant a lordly oversight of the channels along which his goods moved to market.

Enterprise, however, is not to be stayed by closed judicial doors; other techniques than resort to the law were at hand. If the courts were unwilling to continue the job, business concerns might look after their own marketing systems. The right of the vendor to select his own customers seemed to be untainted by legal flaw. If they were not too obtrusive about it, in decisions to deal or to refuse to deal, concerns might police their own trade practices. Among these pioneers in "self-government for industry" was the Colgate Co. Its products—soaps, toilet preparations, sanitary articles—were all trade-marked; a large number emerged from patented processes. About them the company proceeded to elaborate a closely guarded system of distribution. The scheme for the selection of customers consisted of (1) the circulation among distributors of price-lists; (2) veiled threats to withhold supplies from erring tradesmen; (3) demands for information about the activities of irresponsible distributors; (4) requests for assurances that dealers were respecting the recommended schedules; (5) the maintenance in a "suspended list" of the names of firms found guilty of price-cutting; and (6) a refusal to sell to those whose unethical actions placed in jeopardy the marketing arrangements of the company. In spite of its industrial privity, the plan was hurled into court.²⁰ In its justification ancient and obvious rules of the law were plead. A concern could not be forced into business relations against its will. The judiciary had no power to order a sale to a party with whom the company did not choose to deal. The Clayton Act had declared that nothing therein "shall prevent persons engaged in selling goods, wares, or merchandise from selecting their own customers in bona fide transactions and not in restraint of trade."²¹ The issue, of course, was whether the marketing plan, in detail and persuasion, was in restraint of trade. It was not easy to cry monopoly, for every article had to make its way against a rival good which did not bear the Colgate trade-mark. So the court was content to beg the question and in disregard of its tightness to hold the entente of usages immune to legal attack.

If the issue had been the selection of customers, pure and undefiled, it might have ended here. The scheme, however, was susceptible to other uses; as it hit its stride alien objectives might smother the prestine end. To sit in an ivory tower, to contemplate one after another the names in a catalog, and to accept or reject with the aid of Moody's manual, a standard of morality, or without reference to norms altogether, is one thing. To set up an orthodoxy of market usage, to implement it with an information service, and to ostracize

²⁰ *U. S. v. Colgate Co.*, 250 U. S. 300 (1919).

²¹ Note also the cases of *United States v. A. Schrader & Son, Inc.*, 252 U. S. 85 (1920), and *Frey and Son, Inc. v. Cudahy Packing Co.*, 256 U. S. 208 (1921).

all who do not conform—especially if the scheme is reduced to writing—is something quite different. The *Beech-Nut case*²² presented the plan worked out in such detail and backed by such a punch that duress could not escape notice. A system of private police was visible, without resort to the spectacles of inference, and the Court was compelled to call the arrangements illegal. The edge, however, was thin; and lower tribunals could not always escape confusion in following the dictates of the bench above.²³

A shift had already occurred in resort to the law. If the courts could no longer be invoked to lend their auspices to restraint—on the theory that they were giving effect to patent rights—the corporation was quite ready to police its own marketing channels. The effect of the Beech-nut decision was to teach wariness rather than to induce surrender. Since it was exposed to antitrust, the scheme had to be constructed so skillfully and operated so smoothly as not to exhibit a picture of duress which might be taken into court. It is, however, a bit awkward to dodge the law rather than use it as a club; and the quest for sanctions was not to be abandoned without giving ingenuity one more try.²⁴

ALONG THE HORIZONTAL LINE

• As the patentee attempted to drive his control vertically down the marketing channel, he did not neglect the horizontal line. His corporate estate was threatened from left and right by grants from the Government which invaded the technical domain which he wished to preempt. If such claims could be quenched, driven into narrow reserves, or become the property of a mutual accord, danger of a flank attack was removed. Secure in an exclusive right to all the techniques which made up his industrial art, his dominance over the distribution of his product became less vital. As he won protection against rivals, he could afford to relax his authority over his retail outlets.

The ordinary conduct of business often suggests a pooling of patents. A number of inventions are no more than kindred ways to the same end; a concern acquires the several patents, puts the fittest to work, or unites elements from several into a process which is better suited to its task than any. A number of inventions make up a single production process; if they are to be used efficiently, they must be used together. If there were no law to limit, condition, or forbid, the usages of business would impel corporations to seek to acquire competing or complementary patents held by adverse interests. The simplest way to an amalgamation of patents is by purchase²⁵ or by merger under a single control.²⁶ But where access to technology is

²² *Federal Trade Commission v. Beech-Nut Packing Co.*, 257 U. S. 441 (1922).

²³ The lower courts, as well as businessmen, were in something of a fuddle. In the *Beech-Nut case*, the Circuit Court of Appeals for the Second Circuit, 264 Fed. 885, had expressed difficulty in seeing any difference in their effects upon restraint of trade between a tacit understanding and a written agreement. And so it held itself bound by the Colgate holding and was reversed.

²⁴ *U. S. v. General Electric Co.*, 272 U. S. 476. See pp. 80–82 below.

²⁵ The Eastman Kodak Co. presents an example of the dominance of an industrial technology by purchase. But purchase was a single device in the strategy. The aggressor softened the potential seller by an action at law before offering terms. Westinghouse and countless others have used this everyday legal device to make secure their technical holdings.

²⁶ The United Shoe Machinery and the General Electric Cos. are outstanding examples of the acquisition of dominant patent control through the merger of numerous small competitors. The National Harrow Co. offers another illustration.

the life of trade and separate enterprises are willing to lose neither their identities nor their independence, a more feasible method must be found. The need is met by the device of cross-license—itsself an invention of the first magnitude in turning inventions to account.

A "pool" exhibits a complex of motives, usages, results; it presents a variable appearance to the law.²⁷ A number of corporations hesitant to submit their claims to the ordeal of law, enter into a mutual agreement to cross-license all patents. The accord may include all the firms in the industry, a select few, or only the dominant two. It may make the industrial arts common property, decree the conditions of access to the technology, or barricade the trade in behalf of the self-elect. Or a number of individuals may severally possess legal claims to interdependent parts of a process; and a common control may be essential to the creation of a product which represents the current state of the art. Or the pool may serve as instrument for the creation of a monopoly and as armament against legal attack. Or most likely of all, as affairs go in not the trimmest of worlds, all of these urges with varying heat may find expression in the same scheme.

It is insisted that, if there were no pooling of patents, the modern receiving set would be a mere ideal; the airplane, an entity just out of reach, still inchoate in a hundred separate inventions. It is claimed for petroleum and the automobile that the pool widens the technological base, makes existence tolerable for the little fellow, and promotes good will within the industry. It beats rights which belong to countless individuals into a mutual interest and enlists diverse techniques into a common adventure in production. To the contrary it is argued that the monopoly which results gives little incentive to the rapid advance of the art and stands as a barrier against the shift of technology to a new base. In support General Electric and the Aluminum Corporation of America are cited for their failure to accord to invention a real opportunity. Motives good and bad, lawful and illegal, often walk hand in hand. An understanding which avoids a resort to law and insures a better product may accomplish quite other things. It may decree a stop to the competitive struggle and make a gift of security to a business enterprise. It may bring financial stability to the independent so long as he is content with the niche to which he has been assigned; it may create a scaffold wherefrom the elect may build a price floor.

The pool is no current novelty—though in these latter days it has been fitted out with all modern improvements. As early as 1856 a group of Howe, Singer, Wheeler and Wilson, and Grover and Baker found it advantageous to bury their differences over claims in its technology to the greater good of the sewing machine industry. A union of grants promised to recoup the losses of promotion and to save the expenses of an impending legal campaign which threatened to exhaust the resources of all the hostile parties. A licensing system was established; and lest the charity of any of the parties go unrewarded, a royalty of \$15 was decreed for each machine sold. Presently, however, a falling market exerted its pressure, and a vision appeared of a larger intake through a lower price which would bring

²⁷ In terms of sheer rhetoric the pool has a decided advantage over purchase and merger. The cross-license agreement presents the appearance of equality among the participant industrial interests. It eliminates the stigma of dictatorial domination which characterizes more overtly suppressive techniques. Even if overlordship continues to exist, it smacks far more of noblesse oblige than of blitzkrieg. For example, compare General Electric with ALCOA or RCA with Kodak.

the machine within the reach of lower income groups. It was not easy to maintain the closed preserve against the increasing pressure from outsiders who wanted to barge in. Yet the fortifications withstood invasion until the expiration of most of the basic patents in the seventies.

It was 20 years after the sewing machine pool disintegrated before the first legal test of such an arrangement reached the courts. A number of independents had pooled their patents, organized the National Harrow Co., established a concert of action in marketing their products. A chiseler in their midst, one Hench by name, disposed of goods in whose fabrication the mutually owned technology had been employed at prices lower than those named in the agreement. A suit was instituted by the company against the offending member; the circuit court failed to discover contributory infringement.²⁸ It had no disposition to question either the validity of, or the monopoly conferred by, any of the patents. But it refused to endow a series of patents in lockstep with the legal innocence which singly they possessed. Especially since the record clearly indicated that the several grants had been combined for the very purpose of restraining trade.

But where one bench was blind, another could see. A kindred issue presently came before the United States Supreme Court.²⁹ A license had been extended to a manufacturer by the same company, organized by a number of firms for the specific purpose of holding patents. The agreement recited that products were not to be disposed of on more favorable terms of payment or delivery, or at prices lower than those established by schedules which were attached to the contract. In speaking for the Court, Mr. Justice Peckham drew his inspiration from the current fount of authority, the *Button Fastener case*. His opinion is significant not for what he said, but for the things which he took for granted. He accepted the Harrow Co. as a legal entity, imposing restrictions upon licensees whom it met in bargaining as independent parties. He voiced the familiar the-whole-comprehends-the-part argument. The patentee is legally competent to exploit his grant free from interference. It follows that if the patentee licenses his invention, he may impose such regulations as he chooses. The right to control price is an incident of his right to sell. He takes it for granted that the articles in respect to which restrictions were imposed were themselves the subject of patents. All of these matters are assumed; not one was subjected to judicial scrutiny in the light of the situation which the case presented. The motif of liberty of contract obtrudes and sweeps all before it.

But so backward a position was not easily held. If propriety forbade it to be overruled, ingenuity suggested a way around. In the *Yale and Towne case*,³⁰ which came along a little later, Judge Brown recog-

²⁸ *National Harrow Co. v. Hench*, 83 Fed. 36 (1897). See also *Harrow v. Quick*, 67 Fed. 130 (1895); *Harrow v. Hench*, 76 Fed. 667 (1896); *Harrow v. Hench*, 84 Fed. 226 (1897).

²⁹ *Bement v. Harrow*, 186 U. S. 70 (1903).

³⁰ In *Blount Manufacturing Co. v. Yale and Towne Mfg. Co.*, op. cit. supra, p. 59, the *Bement case* was distinguished. The latter did not involve a combination of patentees who were attempting to restrain trade beyond the limits of their grants. The *Bement case* was later distinguished in *Remington-Rand, Inc. v. International Business Machines Corp.*, 3 N. Y. S. (2d) 515 (1937) at p. 519; in the *Bement case* "the only contracts which were before the Court . . . were the agreements called 'A' and 'B'." See *Rubber Tire & Wheel Co. v. Milcauker Rubber Co.*, 154 Fed. 358 (1907); *Indiana Mfg. Co. v. Case Threshing Co.*, 154 Fed. 865 (1907). The latter cases accept a distinction between a general pool and the *Bement case*, but arrive at a different result from the *Yale and Towne case*.

nized the dichotomy of the patent and antitrust, chiseled the vague conflict into specific questions, and in an extended opinion attempted to resolve the issues. In a chapter of judicial history, studded with citations,³¹ he recited the circumstances under which the patent grant conferred a plenary authority. And he discovered a legal gulf between its unsummed parts and the integrated structure. In the instance, "the owners of distinct patents each agreed to restrain its own interstate trade." The monopoly, accordingly, "arises from the combination and not from the exercise of rights granted by the letters patent." And, since "as a part of a plan to monopolize the commercial field, competition is eliminated," the Court was of "the opinion that the contracts are in these particulars obnoxious to the Sherman Antitrust Act." In the "coaster-brake" case, the same reasoning prevailed. The several manufacturers, entrenched behind the solid front of their patents, had decreed production quotas and noncompetitive prices. The Federal court through Hazel, J., found that "the license agreements were resorted to as a subterfuge to aid in stifling competition in trade and commerce."³²

Not, however, until the *Standard Oil case* went up,³³ was the issue of the patent pool presented squarely, naked of all other restrictive practices. A series of cross-licenses had been employed by their owners to combine various oil-cracking patents into an integrated pool. Standing in close formation upon their exclusive rights, the members as a single body had imposed upon the members as individual licensees restrictive covenants. Although a positive influence was exerted over only 26 percent of the national volume, half of the cracked gasoline in the domestic market was brought under control. The price of the product emerged from a formula with many terms, and the influence of such an arrangement could not be set down with mathematical exactness. Into the hypotheticals of the causal role of a single factor among the host which far-flung circumstance brought into play, Mr. Justice Brandeis did not choose to go. Instead he spoke for a Court whose concern was a simple problem of legal procedure. He had no quarrel with the decisions which held "that lawful individual monopolies granted by the patent statutes cannot be unitedly exercised to restrain competition."³⁴ But, however, it might be otherwise, in the particular instance, "no monopoly or restriction of competition in the business of licensing patented cracking processes resulted from the execution of these agreements." The presumption was of innocence, mere combination did not shift the burden of proof, evidence of positive wrong-doing was absent. The agreement imposed no undue restraint upon interstate commerce.

Thus the Court refused to sanction or to condemn in blanket-terms the practice of cross-license.³⁵ A compound of exclusive rights, each of which was unquestioned, did not insure validity; an array of

³¹ His argument made much of *Bloomer v. McQuewan*, and deftly turned the *Paper Bag cases* to account.

³² *U. S. v. New Departure Mfg. Co.*, 204 Fed. 107 (1913). With increasing reliance upon them, the *Standard Sanitary*, *Motion Picture Patents*, *Hench*, and *Yale and Towne* cases were upon the way toward becoming canonical.

³³ *U. S. v. Standard Oil Co. (of Ind.)*, 283 U. S. 163 (1931).

³⁴ Citing *Hench v. Harrow*; *Blount Mfg. Co. v. Yale and Towne Lock Co.*; *Standard Sanitary Mfg. Co. v. U. S.*; *Motion Picture Patents Co. v. Universal Film Co.*

³⁵ In *Lynch v. Magnavox Company*, 94 F. (2d) 883 (1938), the court stated (p. 890): "If the purpose of a plan is to effect a monopoly, or to fix prices, or to impose otherwise an unreasonable restraint, then the (Sherman) act is violated by use of any means to that end, including a cross-licensing arrangement."

grants in solid phalanx did not in itself decree invalidity. The public interest may, or may not, be served by the patent pool; service or disservice depends upon the reach, the character, the usages of the controls which the process of cross-license brings into being. The union of grants creates a situation which makes easy the imposition of restrictions; but restraint itself does not inhere in reciprocity in the use of inventions. The elements out of which it is to be formed are all to be found in recent judgments; yet a definitive rule for the cross license has not yet been declared by the Court. The patent pool and restraint of trade are often found together, yet legally they are severable. As an instrument, a common access to an industrial art is neither good nor bad in itself. Its legal quality depends upon its employment.

STILL THE OPEN ROAD

If the national economy had been cut to blue-print, the law of patents today might be reduced to definitive statement. But general language gets touched off by concrete cases, which as they pass present a parade of unlike situations. In these the controls exercised by the patentee radiate along intertwined lines which do not fall into a design of the horizontal crossed by the vertical.³⁶ Rulings, however valid against the records which called them forth, are viewed with suspicion as they wander across the years or into alien industries. It is, accordingly, quite enough to set down some five judgments, so recent and authoritative as to enjoy wide currency. As points they give directions to a trend—so far as the trend is set by the Court's decisions.

The first, oldest, and most perplexing of these is the *General Electric case*.³⁷ As long ago as 1911 the company had experienced a bout at law. The Department of Justice had sought to dissolve its combination with National Electric and to break up its patent dominance over the industry.³⁸ In response to attack it took over the affiliate company—a move which it had hesitated to make; possessed itself of fresh patents to replace those whose life had expired; and, by a system of licenses, set about making secure its own corporate estate. Access to the technology which it controlled was the ticket of admission to the industry. Quotas were assigned to itself, to Westinghouse, to the independents who lived by tolerance. A division of labor was decreed in respect to aspects of the manufacturing process. Precautions were taken to prevent any break in the structure of quoted prices. The retail outlets were made agents, and title was retained by G. E. until the lamps—themselves subject to no patent—had passed into the hands of the ultimate user. The government of the industry was equipped with an effective system of police. Economic necessity and a cordon of contracts supported a grand adventure in corporate cooperation.³⁹

³⁶ It is only in the unusual case that various restraints, which have been conjured up by patentees to protect a dominant industrial position, exist separately. Almost every license or lease agreement contains some combination of patent suppression, pooling arrangement, price-fixing agreement, or extended dominion over unpatented products and wares. The mixture of articulated legal rationalizations which support these combined arrangements defies categorization; the adroit manner in which the arrangements themselves skirt the prohibitory doctrines of the courts is a reflection on the inadequacy of judicial bodies to meet the legislative problems involved in defining patentee power.

³⁷ *U. S. v. General Electric Co.*, 272 U. S. 476 (1926).

³⁸ 1 D. & J. 267 D. C. N. J., (1911).

³⁹ For the history, detail, and industrial office of "the G. E. plan," see pp. 93-103, below.

An antitrust action, instituted by the Government, brought the scheme to the attention of the Supreme Court. The catalog of trade practices, in vogue in the industry and argued in the briefs, found little reflection in the opinion which Mr. Chief Justice Taft wrote for himself and his concurring brethren.⁴⁰ It constituted a fabric of market usage which presented to the law a docket of issues to which the Court had never given answer. Yet because of its complexity, a failure to entertain questions which were posed, an inability of members to come into agreement, or an absorption of the bench with a single aspect of the case, almost all of these enigmas were pushed to one side. In his narrow confines it was possible for the jurist to make his approach from the vantage point of "to make," "to vend," or "to use."⁴¹ But, passing up alternatives for reasons which he does not disclose, Taft finds the issue in the right to sell. Upon this he takes his stand and in respect to the situation before the Court, he explores its correlatives.⁴²

In spite of a parade of "therefore's", Taft broke no new ground. Once before the Court had construed the privilege conferred by patent in respect to the horizontal control of price. And in that case,⁴³ the restrictions had been placed directly upon patented articles, whereas here they were imposed upon the unpatented end-product of a complement of patented processes. In his opinion Taft does not recognize this distinction; nor does he suggest that a reward more closely in accord with that contemplated by the Constitution might be obtained through a clean-cut provision of royalties. Instead the Chief Justice argues that a patentee "conveying less than title to the patent" may grant "a license to make, use, and vend" for "any royalty, or upon any condition, the performance of which is reasonably within the reward" he is "entitled to secure." If he "goes further and licenses the selling of the articles," he may impose restrictions upon "the method of sale and the price," provided "the conditions are normally and reasonably adapted to secure pecuniary reward for the patent monopoly."⁴⁴

The General Electric decision is a triumph for rhetoric. The law ceases to bother over what is done and poses its decision upon the proprieties by which it is accomplished. If the manufacturer had parted with the title to its products, its scheme of marketing might have been without the law. But, since retailers were its agents, since wares were its own until they passed into the hands of the ultimate purchaser, surely it had the right to name the price at which the concern itself was willing to part with its own property. Thus the Court

⁴⁰ There was no dissent in the *General Electric case*, a most surprising circumstance in view of the fact that Taft, Holmes, Brandeis, McReynolds, and Stone were among the Justices then on the bench.

⁴¹ The distinction goes back to the case of *Bloomer v. McQuewan*. In *Adams v. Burke*, Miller spoke of the substantive rights to make, use, or vend, which might be granted separately.

⁴² There were reasons, of course. The doctrine of use, upon which an earlier bench had relied, had become outmoded; yet its values for public policy were retained. Another approach, however, could be made instrumental to the industrial authority of the patentee which the Court sought to bolster—the doctrine of sale. The premises granted, the logic of legality—which might have done rather well in a suit between private parties—moved upon a much higher critical level and came to affect a concern with public interest.

⁴³ *Bement v. Harrow*, op. cit., supra.

⁴⁴ Although one scheme of licensing is pronounced legal and distinguished from that struck down in *Dr. Miles Medical Co. v. Park*, supra., on the specific ground that General Electric was making the retail sales and there was no question of its right to fix the prices at which it disposed of its own goods, it is hard to see why Taft's argument could not be applied with equal validity to the *Dr. Miles* arrangement. The Chief Justice suggests that in both the *Dr. Miles* and the *Standard Sanitary cases*, the very purpose was to restrain trade. But the question of such an intent is the very issue presented—and not met—here.

revealed a procedure by which the patentee might respect recent decisions and yet keep his product his own so long as he wished to subject it to remote control.

The judgment transcended the issue to which it was addressed. General Electric had invoked agency as a device by which to make legal a marketing scheme grounded upon patents. In his opinion Taft allows agency to usurp the case,⁴⁵ and leans very little, if at all, upon the grants from the Government.⁴⁶ As the manufacturer becomes the vendor in the ultimate transaction, he opens the way for the fixing of prices, for unpatented as well as patented goods. The ruling is, of course, circumscribed to the distinctive scheme of legal and marketing usage then before the court. If manufacturing concerns could regiment their marketing systems to the G. E. agency pattern, they would seem to be immune to the law. If they could not, ingenuity and resource still had their work cut out.⁴⁷ Recent holdings are disregarded; dialectic has no traffic with public policy; the law distinguishes where there is no difference in fact; an authority is created to become an anaesthetic to more severe holdings of the Court.

Yet, in spite of support to the cause of restraint, the General Electric decision is somewhat off the judicial beat. Three very recent cases have gone far to restore prestige to rejected doctrine. In the *Carbice case*,⁴⁸ the Court knowingly probed former utterance to discover and make explicit the values which should shape the law of patents. A trio of propositions lays afresh an ancient groundwork. First, an attempt of the patentee to secure a reward from the supplies employed in the operation of his machine, rather than from the invention itself, has no legal support. Second, such a limitation upon the contractual freedom of the patentee is not mitigated by "the peculiar function" of the protected device nor by the unique charter of the materials used with it. And, third, the exclusive right assured by the grant can go no further than the invention as described in the claims.

In a later case⁴⁹ the Court itself had occasion to construe these propositions. The Barber company was the owner of a patented road-building process. This it permitted road builders to use without charge so long as they purchased from it an unpatented emulsion which the process called for. The Leitch company also manufactured and distributed an emulsion which served the purpose just as well. The suit for contributory infringement thus concerned a matter which lay on the fringe of the holding in the *Carbice case*. There was "no sale of the process" subject to patent; no legal "relation

⁴⁵ Note that the judgment is set down by an unusual alliance among justices. Brandeis and Holmes, J.J., had favored resale price maintenance as an elementary proposition. Neither had grounded its validity upon patents and neither needed a concept of agency to help it into the law. Taft's argument—which is not their argument—moves toward their conclusion: and, since he is going their way, they accept his rationale.

⁴⁶ Note, especially Taft's handling of citations. He admitted that *Motion Picture Patents*, overruled the *Henry v. Dick case*, and discredited the *Button-Fastener case*. But, he argued that Mr. Justice Peckham's discussion of the rights of the patentee in *Bement v. Harrow* was fundamental. Moreover, the use of the Button-Fastener decision was not essential to the result; it could have served only an *a fortiori* purpose. In effect the *Button-Fastener* judgment is in revised terms reinstated, although technically allowed to remain upon the shelf. And the *Bauer* decision is in fact overruled, although nominally allowed to stand.

⁴⁷ The breach was repaired by the fair trade laws of the several States and by the Miller-Tydings amendment to the Sherman Act. With the infirmity removed, resale price with no aid from patents, could be imposed upon the most remote distributor.

⁴⁸ *Carbice Corporation v. American Patent Corporation*, 283 U. S. 27 (1931).

⁴⁹ *Leitch Manufacturing Co. v. Barber Co.*, 302 U. S. 458 (1938).

whatever existed" between the patent-user and the patent-owner.⁵⁰ The proprietor of the grant received no direct revenue from his invention. In a short opinion, which reversed the lower court, Mr. Justice Brandeis held that there had been a contributory infringement. He went verbally beyond the *Carbice* holding to state that limitations upon the patentee are "inherent in the patent grant" and that no form of legal words could validate that which is an obvious attempt to control the market in unpatented wares. The constraint upon the patentee applies, "whatever the nature of the device by which the owner of the patent seeks to effect such unauthorized extension of monopoly."

The two cases recall the original nature of the patent grant; a third brings price-fixing squarely back into focus. The Ethyl Corporation—whose stock is held by General Motors and Standard Oil of New Jersey—is the manufacturer of a patented fluid used to prevent knock in gasoline. The material is a dangerous poison and was distributed to refiners who process their gasoline in accordance with conditions set by the patentee and dispose of it through retail outlets. The jobbers operate under licenses, terminable at the will of the Ethyl Corporation. Although nominally they are silent on price, the licensor was by no means unmindful of the virtues of a close accord. When the scheme was subjected to the scrutiny of the United States Supreme Court, "the facts of the case" indicated that the ordinary standard of judgment in respect to the renewal or the cancellation of a license was the jobber's compliance with "the marketing policies and prevailing practices of the petroleum industry."⁵¹

In the opinion of the Court, Mr. Justice Stone probed to the heart of the matter. Conspicuous among "controls which the Sherman Act prohibits and the patent law does not sustain is the regulation of prices and the suppression of competition among the purchasers of the patented article." In the instant case the scheme was not limited to a mere selection of customers or to a mere refusal to sell. Nor were the conditions shaped towards "stimulating the commercial development and financial returns of the patented invention."⁵² Rather they were directed toward "the commercial development of the business of the refiners and the exploitation of a second patent monopoly not embraced in the first." The patent on the cracking process was one thing, the patent for the use of tetraethyl lead quite another—at law each must stand upon its own bottom. "The patent monopoly of one invention may no more be enlarged for the exploitation of a monopoly of another than for the exploitation of an unpatented article, or for the exploitation or promotion of a business not embraced within the patent."

⁵⁰ The lower court, *Barber Asphalt Co. v. Stulz Sickles Co.*, 89 F. (2d) 960 (1937), made much of the distinctive situation. It is of note in passing that it does not differ materially from the arrangements made by Colgate to dictate the resale price of its wares (op. cit. supra, p. 75). Here, however, upon the right to select customers was grafted a contributory infringement action against vendees of their customers. And the forms of the two actions were different. Here a concern sought to employ access to the courts in the maintenance of its marketing arrangements; there a concern was content to police its own marketing channels and was warring off an attack by the Government for restraint of trade. In the two decisions—all other cases aside—the Court forbade the use of a legal sanction without creating an exposure to a legal attack.

⁵¹ *Ethyl Gasoline Corp. v. United States*, 60 S. Ct. 619 (1940). A combination of regular gasoline and the patented fluid was patented by the Ethyl Corporation. It was under this patent that refiners produced the patented gasoline which was sold to jobbers, and it was upon this indirect patent relationship that Ethyl attempted to justify its imposition of retail prices.

⁵² The case had had its prelude in copyright. In support of its judgment, see the opinion of the Court, also written by Mr. Justice Stone, in *Interstate Circuit Co. v. U. S.*, 306 U. S. 208 (1939).

The case seems clearly to point the trend for the law of patents. The owner of the grant, declared the Court, "may grant licenses to make, use, or vend, restricted in point of space or time, or with any other restrictions upon the exercise of the privilege granted."⁵³ But, by a condition attached to the license, "he may not enlarge his monopoly" and thus acquire some other power "which the statute and the patent together did not give." The *Ethyl case* appears to dispose of block price arrangements, at least in case of sale. And it seems to rob the verbal symbols of the General Electric decision of much of their content.⁵⁴ Its rationale moves toward halting the use of patents as an instrument of restraint.

The march of decisions is never quite straight; and the line of cases just discussed is marked by a break. The *Talking Pictures case*, which preceded the *Ethyl* decision by 17 months, exhibits the tendency of doctrine to revert to kind.⁵⁵ Western Electric was the owner of an amplifier capable of multiple employment. It licensed a number of manufacturers restricting each to a particular use. Talking Pictures purchased amplifiers from a concern bound by a restrictive covenant and used them in a way for which the vendor was forbidden to manufacture. The patentee went beyond his licensee to the user and brought suit for contributory infringement.^{55a}

In the majority opinions—on hearing and rehearing⁵⁶—the argument is substantially the same. The buyer had purchased with knowledge of the restriction and hence was bound by its terms. Since sale of the amplifier for a purpose not comprehended in the license was infringement, purchase with knowledge constituted contributory infringement. How it would be if the defendant had acquired the tubes in open market, the court said not, for the sale was never such as to bring the tube into "the ordinary channels of trade." The essence of the argument was the contention that since the patentee has power to refuse a license, it followed that he had the lesser power to license on his own conditions.⁵⁷ It is an elaboration of the severe logic of the

⁵³ Note again the shift of the court from "right" to "privilege." In support of Stone it can be argued that it was the usage of the word "right" which had gone astray and that his word "privilege" is in accord with original meaning.

⁵⁴ It does not, of course, alter the decision in *Brumet v. Harrow* except by implication. This judgment permitted the existence of price controls on patented articles disposed of through a legitimate licensing agreement.

⁵⁵ *Western Electric Co. v. Talking Pictures Co.*, 305 U. S. 124; 304 U. S. 175 (1938). The cases are intellectually further apart than the dates would indicate. Black alone among "the new justices" took part in the first decision; in the second, Reed also participated. Reed once and Black twice dissented from the opinion of the Court. In the *Ethyl case*, four "new justices" took part and all concurred in the opinion of the Court.

^{55a} English cases have pushed the latter patent into the category of chose in action or incorporeal chattel. Differentiations have been made between rights "to make, use, assign, and vend" and the product resultant from their application. A way is opened for a separation of privilege from function; a suggestion portends an alternative to the *General Talking Pictures case*. Yet the English holdings have been in furtherance of greater patentee protection; the privilege of nonuse is preserved; the validity of restrictive covenants upheld. The march of consequence has not been materially different from that in the United States. See *Edwards v. Picard* (1909), 2 K. B. 903; *British Mutoscope and Biograph Co. v. Homer* (1901) 1 Ch. Div. 671.

⁵⁶ The original opinion of the Court was by Mr. Justice Butler; the opinion, following reargument, by Mr. Justices Brandeis.

⁵⁷ Such a proposition, from which the Court's whole argument flows, seems to beg the question. In brief it recites that the whole must comprehend the part, without specifying what the whole is. It makes an absolute of a property right and erases the limitations on a privilege given for a purpose. Yet, by decisions of the Court, the rights of the owner of a patent are limited to the privileges which it conveys. He cannot impose upon a licensee restrictions which do not inhere in the grant he possesses. His freedom to "do as he will with his own" stops sharply at the barriers upon restrictive use described by public policy. Outside his limited monopoly, the covenants, the licenses, the arrangements by which the invention is turned to account are subject to the general law. The freedom to grant or withhold does not define the identity of the thing given. The effect of the contention, therefore, is to raise a question rather than to take a stand on a rule of law. The real issue—the issue in the instant case—is what the limits of the privilege are which by license the owner of a patent farms out to another.

law of sales which goes back to Clifford⁵⁸; a rejection of the doctrine as set forth by Taney,⁵⁹ that the authority of the patentee stops with sale for use. The *Carbice case*, held the court, was not applicable, since there had been no attempt to extend the patentee's monopoly to unpatented wares.⁶⁰

In able dissents, Mr. Justice Black laid bare defects in the opinions. He used the *Carbice* and kindred holdings to undermine the foundations of the Court's argument. Mere notice, unless its concern was with a right sanctioned by the law, was devoid of legal effect. As an expression of the doctrine of good faith it could not create for the patent owner an equity which without it he did not possess. In consequence once the articles were disposed of for adequate consideration, the interest of the patentee was terminated. That was the holding in the *Albany case*, sustained by a long line of decisions.⁶¹ Butler and Brandeis alike come to the case as if it were devoid of a general interest and as if as a private action it were subject to a single approach. Black is content to meet them upon their own ground and to show how legally exposed is their position. Yet his attitude is clearly determined by larger values; a private action does not declare a moratorium upon considerations of public policy.

Thus, today as yesterday, the emergent law of patents streams from two opposing lines of development. A doctrine, reaching back to Taney, would severely limit the exclusive right of the invention and strike down all conditions upon use. Another stemming from Clifford would offer to the patentee all the reward he could secure through the exercise of freedom of contract. As situations differ, as cases come in volume, as unlike minded men sit in judgment, paths may be narrow but they are not straight. A doctrine gets the support of contradictory reasons; a trend becomes obscured by cross-currents of opinion. Almost every decision leaves its tracings upon a legal pattern not yet clearly defined. Judicial freedom is a gift of trends which close, move apart and converge upon cases which must be judged. Currently the Court enjoys a liberty to shape, as seems to it good, the law of patents.

⁵⁸ *Mitchell v. Hawley*. Argument and holding are in accord with the *Button Fastener case* and *Henry v. A. B. Dick Co.*

⁵⁹ *Bloomer v. McQuewan*.

⁶⁰ The continued pushing of *Leeds and Catlin* to one side as not in point indicates an actual abandonment by the judiciary of the Clifford doctrine as stated in *Mitchell v. Hawley*. With the exception of the opinion in *General Talking Pictures* no salutes to the departing doctrine have been fired by the Supreme Court since the Dick decision. *Leeds and Catlin* itself has frequently been distinguished. *Hever v. Duplicator* (op. cit. supra, p. 68; the *Carbice case*, op. cit. supra, p. 32). Recently it was held not in point in *Bassick Co. v. Hollingshead Co.* (298 U. S. 415 (1936)). There the Court refused to permit a patentee to claim further dominance of an invention through a patented improvement which altered neither its principles of operations nor construction. In accord are *McGrath Holding Corp. v. Anzell* (58 F. (2d), 205 (1932)); *Bassick Mfg. Co. v. Adams* (52 F. (2d), 38 (1931)).

⁶¹ *Albany Paper Co. v. Morgan Envelope Co.*; *Standard Sanitary Mfg. Co. v. U. S.*; *Motion Picture Patents case*. For earlier decisions see *Bloomer v. McQuewan*; *Bloomer v. Millinger*; *Adams v. Burke*.

CHAPTER VI

MAINTENANCE OF THE CORPORATE ESTATE

THE TELEPHONE—AND LONGEVITY ¹

The identity of a thing depends upon the uses it serves. As it exchanges masters, it undergoes a change of character. As the patent was made over by the inventor into bondage to the corporate estate, it put on the ways of business. It became a weapon in the competitive struggle; was employed to defend and push forward frontiers; was thrown up as a barrier against legal attack. As a title to technology—without access to which it was impossible to carry on—it was used as a fence with which to make secure the preempted domain and as a sanction upon which to ground the government of an industry. Its original task of promoting the useful arts had to patch up such a truce as it could with the acquisitive duties thrust upon it. A docket of some five widely selected cases—the telephone, the electric lamp, beryllium, the glass bottle and the automobile—indicate its unique development in response to offices variously thrust upon it by the national economy.

In the beginning the telephone was a toy; today it is the stock-in-trade of the world's largest nonbanking corporation. It derives, in almost apostolic line, from the telegraph; and as soon as dots and dashes made orderly passage along a wire, men began to hunt for a way to transmit articulate sound. The older suggested the newer invention; the climate of technical opinion invited the quest; the search could hardly have gone unrewarded. As early as 1854, only 14 years after Morse had obtained his patent, a certain Bourseul came close to a theoretical solution of the problem, "Suppose that a man speaks near a movable disk, sufficiently flexible to lose none of the vibrations of the voice; that this voice alternately makes and breaks the connection with a battery; you may have at a distance another disk which will simultaneously execute the same vibrations."

Idea invites design; and a few years later Reis invented and manufactured a device by which musical tones could be transmitted; but his make-and-break variations were too gross to reproduce the delicate vibrations created by vowel sounds. His instrument could be—and later was—used to transmit the human voice, but only through the application of a bit of knowledge which was presently to be supplied. As he began to tinker with it, Alexander Graham Bell made no attempt to increase the sensitivity of Reis' telephone. Instead he took his cue from an effect discovered quite by accident and varied the strength of a feeble but continuous current to secure vibrations. When a year later ² he applied for a patent, he had not yet succeeded in transmitting distinctly the human voice. But the idea had been

¹ The exhaustive study by the Federal Communications Commission of the American Telephone & Telegraph Co., carefully checked, is the primary source of information.

² The dates are 1875 and 1876.

captured and the result awaited only an instrument to be perfected by a mechanic. When later the patent fell under the scrutiny of the Supreme Court, it was argued that Bell did not realize the significance of his discovery and had asserted essential claims after a rival inventor has shown their importance. The contentions were not sustained—though the brethren on the bench were far from a single mind as to who it was, if it was a single person, that had invented the telephone.³

What conception Bell had of his own invention signifies little, for it was not unique and did not go unchallenged. On the same day that he applied for his patent Elisha Gray, of Philadelphia, filed a caveat and described a similar instrument which also used a variable resistance to alter the strength of a continuous current. Gray's patents were exploited by subsidiaries of Western Union and became the subject of an infringement suit brought by the Bell interests in 1878. But, before the court could distinguish the genuine from the spurious letter, the parties compromised their differences. Western Union acknowledged the validity of the Bell claims, licensed Bell to make use of all the Gray patents, and withdrew from the field. It agreed to pay 20 percent of the cost of all new patents developed or acquired by Bell; in return it was to receive 20 percent of all Bell's rents and royalties. Thus a merger of competing patents was effected without leave from any public authority and the question of priority between them was never judicially settled. How much of the technology was public, how much subject to exclusive right, and who was justly entitled to so much as was novel will never be known.⁴

Electricity was ready to reveal its secrets; in a land of tinkerers many had commerce with it; and two parties did not exhaust the claims to invention. A bitter opponent of the Bell interests was the Peoples Telephone Co., which produced a patent issued to Daniel Drawbaugh, a rural mechanic. A combat at law ensued; 366 witnesses were called for the parties; the trial ran for 3 years. It produced evidence that Drawbaugh, working independently at Eberly's Mills, Pa., had invented a telephone which anticipated Bell's by several years. On appeal and by a majority of one vote, the Supreme Court upheld Bell's claim to priority. Drawbaugh had not applied for a patent until he had seen Bell's on exhibit at the Philadelphia Centennial in 1876; the delay of several years was considered proof presumptive that the claims were dishonest. Three of the seven justices who sat, however, were convinced that Drawbaugh hit upon the essentials in 1869 and produced a satisfactory instrument in 1871. If one more judge had been similarly persuaded, or if there had been a full bench of nine, the invention might have become a part of the public domain.⁵ The four votes by which the Bell grant was sustained are less than a majority of the Court.⁶ Thus, a single vote of an incomplete bench decreed

³ *The Telephone cases* [126 U. S. 1 (1887)].

⁴ Note the dying statement of Gray: "The history of the telephone will never be fully written. It is partially hidden away in twenty or thirty thousand words of testimony and partly lying on the hearts and consciences of a few whose lips are sealed, some in death and others by a golden clasp, whose grip is even tighter." Federal Communications Commission, *Investigation of American Telephone & Telegraph*, exhibit 1980 p. 2.

⁵ More than 2 years had lapsed between Drawbaugh's invention and his application, so the patent could not according to statute issue.

⁶ Mr. Chief Justice Waite, who was "the majority," arose from a sickbed to deliver the opinion of the Court. It was his last appearance; he returned to his death bed. Motion was later made for reconsideration and was rejected on the ground that no member of the majority who sat—now 3 Justices in a bench of 9—had changed his mind.

the foundation of exclusive right upon which the structure of the telephone industry of today rests.

The Bell interests were now in a position to assume the offensive. One powerful opponent had been bought out; another had been vanquished in legal combat; a sanction had been accorded its claims by the highest court in the land. In 16 years it instituted more than 600 suits for infringement of its patents. In most instances, however, the defendants came to terms before trial and only 12 cases were carried so far as to elicit written opinions. The most stubborn competitor—the American Cushman Telephone Co. and its licensees—withstood more than 200 actions before bowing to the onslaught. A period of expansion arrived; the telephone became an essential of business enterprise; the course of events presented to the patentee—whoever may have been the inventor—a rich harvest. The instrument of the progress of science had become a weapon for the pursuit of gain.

The Octopus is not politically the best loved of American mammals. Opinion ran strongly against the rising monopoly; it insisted that the invention might still be recognized as public property. But a last chance of recovering the lost province was tossed away in a fiasco by the Department of Justice.⁷ A promising rival to Bell was the Pan-Electric Telegraph Co., owned largely by prominent Democrats, who feared suits for patent infringement. Offense is not an untried defense; and while Attorney General Garland—who as luck would have it owned 10 percent of the stock of the concern—was away on vacation his Solicitor General acted. Alleging that the invention had been anticipated and pleading irregularities in the Patent Office, he instituted suit to annul the Bell patents. When the situation came to light, President Cleveland reprimanded the indiscreet official—and to avert a scandal the case was dropped.

But complaints continued to pour in and the issue was referred to L. Q. C. Lamar,⁸ Secretary of the Interior, who was without pecuniary interest. After a thorough investigation he recommended a new suit. Already a congressional investigation had been ordered; but, in spite of its pendency, it was decided by the law arm of the Government to proceed in a Federal court in Ohio before a judge who was regarded as a "patent smasher." As it happened, he died before action could be taken. But the commitment had been made and suit was filed with his successor who, as an ungracious fate would decree, had been a colleague of the Attorney General in the Senate. Then a technical difficulty obtruded; the Bell interests had no official place of business in Ohio, and their lease of equipment was not deemed sufficient to warrant service of process there. So the case was dismissed for want of jurisdiction. Another suit was filed in Massachusetts; the trial court ruled against the Government; as a party without interest no cause of action was open to it. The decision was reversed on appeal; the suit for annulment was free to go to trial.

In the meantime the dominant question had reached the Supreme Court in the private infringement suit mentioned above. The Court upheld the validity of the Bell patents. In holding that Reis had not anticipated Bell, it knocked the main prop from under the argument upon which the Government had hoped to rely for annulment. This

⁷ See Homer Cummings, *Federal Justice* (1937), pp. 29–36.

⁸ Lucius Quintus Cincinnatus, later (1888–93) Mr. Justice Lamar.

left for the Government only the Drawbaugh claims; and, since they had also failed to pass judicial scrutiny, it was driven to discover new evidence. But it hoped that changes on the Court might aid its case for annulment. Five days after the private suit was decided, Mr. Chief Justice Waite was dead. This left the six of the seven who had sat on it divided three to three. Mr. Justice Gray, who had not sat, was expected to support the contentions of Bell, as he had in an earlier suit in a lower court. The new appointee, Mr. Justice Lamar, would probably adhere to the opinion he had formed as Secretary of the Interior. A presumptive line-up of four to four made the new Chief Justice, Mr. Fuller, the crucial man. If at the trial victory could be achieved, he alone on appeal would have to be persuaded to score ultimate success.

So the Government returned to its attack in the Federal court in Massachusetts. There, as was to be expected, the case floundered for several years; a record of some 12,000 pages was built up; and—the issue became moot by the expiration of the patents. It was, however, politically not safe to abandon the suit and, now devoid of legal significance, it dragged on. In 1895, Attorney German Harmon, reluctant to move yet not daring to close the chapter, asked the advice of Congress. That august body refused to receive the buck so graciously passed, and not until 10 years later was the case dismissed—of course, “without prejudice.” The issue was long-since closed. The sole and original inventor may or may not have had his reward. A number of events conspired together to create a judicial result which will probably remain freighted with legal doubt. But the Bell patents did secure the imprimatur of the court—and their owners had corporate work at which to set them.

While the Government was beating a dead horse, the private interests were up and doing. If the sanctions which they held were for limited times, other inventions might be used to prolong their life. So, in a renewed attack upon the independents, the Bell Co. made the Berliner patent on the microphone their main reliance. The application had been filed in 1877 and manufacture of the appliance was begun in 1879. The ritual of squabble and delay—rendered more deliberate by the ceremonial touch of Bell—held the matter in the Patent Office until 1891 when the grant was issued. The device had already been known to commerce for 12 years and its legal protection was now to extend to 1908. Again the Government sued for cancellation—and again divided counsels and political timidity confused the attack. An initial victory for the Department of Justice was followed by a reversal in the court of appeals and the refusal of the Supreme Court to restore the original judgment. In the case the issue of public interest is not clear and the minds of jurists may have wandered down paths which official opinions do not record. At the time many persons regarded the existence of competing telephone companies as a nuisance and even judges, by argument and experience, had been exposed to the case for integration. As a symbol of a single, unified, efficient system of communication, the Berliner microphone may have found the legal way easier.⁹ At this crisis, however, help came to the Government from without. A private suit for infringement provoked a shrewd and stubborn resistance; and defense suc-

⁹ *U. S. v. American Bell Telephone Co.*, 167 U. S. 224 (1897).

ceeded where aggressive attack had failed. The Berlinger claims were construed narrowly, as covering no more than an earlier construction already outdated, and henceforth valueless as a weapon of offense. A few years later an affiliate of Bell, the Western Electric Co., renewed the attack, attempted to perpetuate the control by suits for infringement in the use of telephone apparatus—and failed in its actions. Valid or invalid, patents had during the formative days of the corporation served well the cause of concentration of wealth.

As it became established, the patent came to serve the Bell empire as a weapon of defense. Its grants could not be employed to strike down alternative methods contrived by independent equipment companies; but, where it could not suppress, it could lay tribute, and by 1908 Western Electric was authorized to sell apparatus to nonassociated companies. It could likewise be used to forge an impenetrable legal armament about its expanding frontiers. The character of its business forced the concern into research; and outside inventors, anxious to have their devices put to work and seeking the best bargains they could drive, came first to Bell. A single patent leaves a business enterprise exposed; a net-work of them—with its intricate questions of law, fact, and technical norm—provides a bulwark which it takes strategy, financial resources, and determination to break through. Such a barricade against legal attack Bell was in position to build. The closely-guarded Pupin inventions permitted a close control over the growing field of long distance telephony. A series of patents gave control over radio tubes, which were permitted to reach the public for noncommercial use only. A substitute for the concatenation of gadgets which make up the automatic exchange could hardly be improvised by an independent. Around and between the strategic inventions a fabric of lesser patents was woven. So strong became the defense, that over a period of years only a single judgment has been won against Bell—and that for the sum of 1 cent.

In 1907 the Bell System fell under the dominance of the investment bankers. A change in strategy attended the coming to power of the houses of Baker and Morgan. Capital passed into the strategic place formerly occupied by technology, and the arts and wiles of high finance were called into play. In instances it was cheaper to buy out independents than to fight them; in others it was more feasible to deny access to funds than to press the infringement suit. Finance suggested an easier, less expensive, far surer way to abate a nuisance. The blow was delivered from under cover and was not subject to judicial review. Patents were most important in the "long lines" department, where they became a legal support to boycott and tribute alike. There Bell had a constant opportunity to harass independents. It could refuse to connect the lines for long distance calls or it could agree to joint service and exact the lion's share of the tolls. Its closed communion was later somewhat tempered by threats from antitrust. And since 1919 it has sought the cooperation of the lonely independents who survive in fighting the lowering of rates by commissions and legislatures. It is not that as an instrument of corporate strategy the patent has been abandoned. It is rather that since the investment banker brought in a kit of readier tools, its importance has declined and it has become a reserve weapon. A suit for infringement—with its capacity to wear down and exhaust the resources of

the little fellow—is always at hand, if more humane ways should fail. Its imminence makes the devices of high finance double effective.

As its fortified frontiers have been advanced, the Bell imperium has arisen. The American Telephone & Telegraph is alike holding company and overlord. Western Electric manufactures and markets equipment. A number of regional concerns—the New York, the Southern New England, the Chesapeake & Potomac, the Ohio—provide telephone service within their sharply bounded territories. In addition they provide a dominant market for the output of Western Electric. By the ownership of patents, a maze of licenses, the ties of corporate structure, the concerns are bound to each other and to the parent company. Policies are decreed from general headquarters and executed upon the field. Rates for calls, prices of apparatus, changes in equipment, the steps in the research program, the times at which inventions are to go into use—all these are decreed from on high. A system of absentee landlordism prevails; and through its long lever of authority every error in judgment at the top is magnified as it takes its course down the corporate structure. The organization is too rigid, too ponderous to open the way for trial and error, experimentation with rates, adaptation to local conditions. Over-all investment is the dominant power in an unwieldy financial system; unless upon its face it promises an increase in profits, the innovation has the hardest sort of going. It is not enough that over the years progress has been made. The real question is its sluggish pace and the severe limits of its range.^{9a}

So close a corporation finds it difficult to maneuver; nor can it, without serious shock, put into operation advances in the industrial arts. Its pace is not that at which a science would freely move forward in a laboratory; for inquiry wears the livery of a pecuniary master. Nor is its tempo set by the market, where product is bettered or method improved to gain a competitive advantage. An innovation may have to wait years before getting its opportunity; and a burst of creative effort stands little chance of breaking the dams about vested interests which hold it back. There must be enough of novelty to keep the industry locked against outsiders who may freely employ processes no longer subject to legal protection. But the newcomer must blast his way into markets already largely preempted; and, without access to them, capital is hardly to be had. As the sovereignty of Bell has become recognized, there has been less and less need to drive invention forward at a breathless pace. The record of the company has responded rather accurately to such a norm of expectation.

Facts, of course, are not available for a complete picture of the belated appearance of new techniques. Delays have attended the introduction of many improvements; many innovations, up to the present at least have been suppressed. After an extended investigation the Federal Communications Commission discovered a number of serious lapses, shown by this table.

^{9a} For an analytical study of bureaucracy in business, of which the American Telegraph & Telephone Co. is a brilliant example, see Marshall E. Dimock and Howard K. Hyde, *Bureaucracy and Trusteeship in Large Corporations* (Temporary National Economic Committee, Monograph No. 11).

Equipment	Available	Adopted	Delay— years
1. Subscribers' station equipment:			
(a) Anti-sidetone circuit.....	1904	1934	30
(b) Desk hand telephone set.....	1907	1927	20
(c) Combination hand telephone set.....	1926		1 11
(d) Wall hand telephone set.....	1907		1 30
2. Manual exchange feature switchboard.....	1914	1925	11
3. Automatic exchange switchboards:			
(a) Step by step with director and code-call indicator.....	1922		1 15
(b) Unattended or satellite.....	1908	1927	19
(c) All relay or cross-bar.....	1913	1933	20
(d) Semiautomatic or remote control tollboard and direct toll line dialing.....	1928		1 9

¹ Still not available at the time of the investigation.

Here there is evidence that striking delays have habitually attended the introduction of new apparatus. In 1934 the empire of Bell was lawfully possessed of some 9,255 patents; of these, 1,307 had never been put to use because of "no public necessity indicated." Reasons good and sufficient—at least by reference to the criteria of money-making—may justify the company's action. The point is that the public interest is not a factor, in the judgment to release, defer, or suppress. And the set-up keeps out of play the very impulses which the patent system is intended to release. In many instances a decision not to use is a sacrifice of the common good which it was the very purpose of the constitutional grant to secure. Yet from the judgment of the corporation the public has no appeal.

At one point of time stands the original patent granted to Alexander Graham Bell; at another the industrial empire known as American Telephone & Telegraph. In the creation of the imperium, sanctions emanating from the Government have had a strategic role. Bell may not have been the true inventor; the letters he received may still be beset with legal questions; the grant to Berliner may have been pushed beyond its original orbit; a series of later grants may have been put to uses for which they were never intended. It is enough that the corporation enjoyed legal protection during its critical period when the telephone was coming into use and squatters had to be ejected from a rich commercial opportunity. Once the domain had been secured and barricaded, the patent could retreat from a dominant to a recessive place in strategy. The corporation then could employ the techniques of high finance to ward off attacks, seize markets from independents, and consolidate its gains. But the bludgeon of an infringement suit was at hand if nimbler weapons failed. Once it had clothed itself with assumed rights, it found no hazard in a developing technology. Its only task was to divorce invention from the promotion of the useful arts and tame it into bondage to corporate profits. Along that line it fought and won the good fight—and the patent became enemy to the very purpose of its being.

THE ELECTRIC LIGHT—AND THE CLOSED MARKET

The conquest of night is a matter of many beginnings. An acceptance of the dark; a flicker from a blazing log; the dim rays from a tallow candle; an adjusting of the wick, a cleaning of the chimney, a pouring of kerosene—these were but a parade of makeshifts. The

torch is thousands of years old; the basin lamp of shell or glass, with its indispensable wick, goes back at least a thousand years before Christ. The Argand oil lamp, which increased combustion by the use of a chimney, appeared in 1787. The gas jet bright enough to make the candle ashamed of itself came along in 1821. Yet from none of these things, nor yet from the mating of one of these ideas with another, did the bright filament in a vacuum tube descend. As a method of illumination, electricity is an *immigré* which claims no kinship with the venerable ways of lighting. As a flash of lighting it was known from the earliest of times; as an experiment with a Leyden jar it was popular toward the end of the eighteenth century; as an impulse of energy to banish impinging darkness it appears only half a century ago. Now only a turn of the finger is necessary to produce a light for reading by the fireplace or to light up a doctor's inspection of some hidden part of the human body, to allow walking as by day under giant electric arcs, or to make a baseball field or an airport assume the radiance of sunshine.

To the mass of Americans Edison's invention in 1879 is the starting point. If one must be accurate, bows must be made to Sir Humphrey Davy and Sir Joseph Swan; and the trail, running through the workshop of Michael Faraday, is lost in the digressive research of a hundred years before. However, it was the American who took bits of useful knowledge from many sources and after trying out various permutations of facts and hunches at last hit upon a lamp which dimly would work. His invention was a carbonized cotton thread operating in a very high vacuum maintained by a one-piece all-glass globe. A year later carbonized bamboo fiber filament was substituted, which in turn by 1904 was being replaced by tungsten filament. To-day more than 96 percent of all incandescent lamps employ tungsten as the filament.

As a giver of light, the new device was in its own class; but only slowly did it make headway against its rivals. Any house, at small expense, could be fitted out with oil lamps from the nearest general store. But for electric lights it had to be wired and a connection had to be established with a power line. The householder rarely had the capital to move outward; a public utility would not move inward until it was sure of enough consumers to guarantee a return upon a substantial investment. The new invention found a welcome in the "better communities of the cities"; in time it invaded the small town and the slum; it hovered tantalizingly just within and just without the reach of country population. By 1934 only 11 percent of American farmers had access to electricity; in 6 years the fraction had risen to 25 percent. But so arrested was the invasion that from 1890 to 1920, 7,000,000 lamp chimneys were manufactured annually and as late as 1937 the year's production reached 1,000,000. Only as electric current led the way could the incandescent light follow.

An electric bulb is a simple everyday article. The original patent has had a chance to live out its span of life three and a half times over. Yet 60 years after its invention the right to manufacture has come into the hands of two corporations. The concentration of control is the result of a series of moves. The Edison Electric Co. was formed to put to use the original patents. A number of others—Brush, Stanly, Spregue, Northern, and Fort Wayne—managed to get footholds in the trade. Westinghouse got its start and its bargaining

position from its possession of patents for alternating current and arc lights. General Electric was formed through the absorption of lesser concerns by the old Edison company. From 1897 to 1911 it maintained a cross-licensing agreement with Westinghouse, which it virtually dominated through a board of patent control.

These early contacts pointed to a dual overlordship of the industry. General Electric and Westinghouse alike held exclusive rights which were adjacent; the two fragments of technology were complementary. Each possessed something of value to the other; it was inevitable that they should get together; their larger understanding, which contains many provisions with which to make effective a system of cross-license, is a scheme of government for the industry.¹⁰ Some 37 companies, all under the mandate of the great powers, are engaged in the manufacture of the article. The great majority, employing about 15,000 workers make lights with tungsten filaments; a number, a product with carbon filaments; and a few, vapor lamps. General Electric and Westinghouse also manufacture as well as license others to manufacture; in addition they produce electric goods—devices, apparatus, machinery—of all sorts and types. General Electric operates five plants and Westinghouse two; five other concerns are authorized to use the same patents. The production of the two corporations and their dominant licensees amounts to 90 percent of the national output. Independents—licensed companies operating plants in the vicinity of New York City—account for the remaining 10 percent.

Manufacture, however, has something of the meaning it has in the automobile industry. General Electric is firm in the faith of efficiency; long ago it installed the assembly line; its production is the putting together of parts. And Westinghouse has followed a little more timidly the same trail. The licensee is beholden to the patentee for essentials of the ware; for the glass bulb, he must go to Corning; and three or four other concerns are sources of supply. The possibilities of permutation are well understood; and bulbs, bases, inert glass, and tungsten filament may be drawn together into many forms. There is—or at least there can be—a lamp to satisfy every need.

Yet variety and quantity production are not good companions. A lamp-for-every-use demands an intricate process; the assembly line moves towards a uniform product. The industry has, with the zest of a new gospel, gone in for standardization. In 1900, for example, there were in the home 175 different kinds of bases and sockets; they have today been replaced by a single type. Ninety percent of the lamps are manufactured for one of two voltages and 99 percent are included in four voltage classes. Six standard lamps, varying from 15 to 100 watts, survive where 45 once covered the same range. Lights for special purposes have been crowded to the sidelines where they can be made to bear the cost of more diffused methods. An enormous saving in expense has attended the regimentation of production; a substantial portion has been passed along to the consumer.

Although a mere container, the glass bulb holds a strategic point. For more than 30 years all bulbs were hand-blown; the art was available to all willing and dexterous enough to use it. In 1912 the glass-

¹⁰ In Europe, likewise, control of incandescent bulbs has been concentrated into the hands of four companies. An international accord keeps the alien wares out of the American market.

blowing machine was introduced, and in 1927 the advent of the perfected Corning machine led to the automatic production of all large bulbs. It is hard for a layman to appraise the novelty which lies in such a mechanism. As he sees it in operation, he respects mightily its intricacy and efficiency; it hardly occurs to him to ask whether, after all, it is not an imposing combination which may be broken down into a basic invention supported by a number of rather simple mechanisms. The enormous output heightens further his sense of awe. One Corning machine, if operated continuously, has a potential daily output of over 800,000 bulbs; in 1937 the domestic production of lamps ran to some 800,000,000. Yet the raw material of the glass is all but costless; the unit expense of blowing is but a fraction of what it was in the days of the handicraft. A method open to all has been succeeded by one closely guarded; still the price of bulbs currently hovers at about one-third of the 1921 level. The older method is as much a matter of common knowledge as ever it was—but access to an obsolete technology is no admission ticket to the industry.

Thus an exclusive right in another technology has reinforced the wall of patents about the industry. Ever since 1913 a series of license agreements have maintained enduring bonds between General Electric and Corning. General Electric employs the Corning processes to manufacture bulbs in its own factories. Outside this sheltered domain Corning enjoys an exclusive right to the entire field. In the sale of bulbs it divides its customers into two classes; the first consists of General Electric and the companies licensed to manufacture bulbs under its patents; the second, of some 26 independent or non-licensed manufacturers. The system is not proof against concentration; the little fellows turn out less than 10 percent of the domestic product.

If these lines are being read by artificial light, the chances are that the bulb is frosted. For in recent years the clear bulb has rapidly yielded ground to the new type. General Electric owns the Pipkin patent, by which the frosting is applied to the inside of the glass, and it has accorded a conditional license of the process to Corning. The latter concern can make and vend bulbs to business firms licensed by General Electric to produce incandescent lights but not to others. Accordingly the independents can purchase only clear bulbs from Corning and must, upon terms dictated by General Electric, have them frosted in their own plants or by other companies.¹¹ A single independent manufactures frost bulbs under a patent issued in 1924. At the fringe of the industry a small firm fabricates miniature bulbs and sells them to a number of independent miniature lamp producers.

An entente such as General Electric-Westinghouse-Corning¹² must look well to its diplomacy. It is of little account to unite at home if an influx of goods from abroad can disturb the terms of the harmony. A measure of protection is found in distance and freights, exchange restrictions, differences in technical specifications, which keep the article from abroad from finding a home here. The tariff is an ancient weapon for guarding the home market; but the dominance of overhead which makes dumping profitable has robbed it of

¹¹ If done without the consent of General Electric, there is a question whether such an inside frosting is not an infringement, for the Pipkin patent is not on the process but on the result.

¹² For a discussion of Corning's place in Hartford-Empire see pp. 107, 115, below.

much of its former efficacy. In many industries, it has for practical purposes been superseded by an understanding between domestic and foreign producers. This has the advantage of erecting a wall that cannot be jumped, resting upon an understanding between gentlemen, and keeping the Government out of private preserves. If overtly it took the form of a conspiracy in restraint of trade, it would be open to legal attack.¹³ But as a method of securing to their owners the full returns from the exclusive rights which they hold in patents a brotherhood which stretches across the seas rests upon another footing. Such an arrangement bottomed upon legal sanctions renders protective duties obsolete. As respects electric lights the tariff has significance only for independents.

The general accord holds each producer to his lawful territory. General Electric is not formally a party to the international understanding. The cartel, however, falls in neatly with the territorial pattern of the domestic industry. Its foreign business, which lies in a province apart, is handled through a subsidiary, the International General Electric Co. The latter concern enters into agreements with foreign corporations in respect to the pooling of information, the exchange of licenses, the putting of local bounds to competition. In addition the parent corporation has financial interests in a number of foreign concerns and is bound by the mutual obligations of contract to some of the constituent members. Westinghouse, too, has a legal existence abroad as the Westinghouse Electric International Co.; and the two subsidiaries abroad exhibit the same friendship they cherish at home. A kinship of interest finds expression in an array of barriers along national frontiers over which the electric lamp cannot vault. Although the United States produces as many bulbs as the rest of the world combined, its exports are very small. And less than 1 percent of all the incandescent lamps used in this country are imported; these consist largely of hand-blown bulbs in shapes and colors not ordinarily produced here. The companies of the several nations, in the cause of progress and the pursuit of gain, share with each other their technical advantages and guard for themselves their domestic preserves.

Thus, secure from attack from abroad, General Electric can devote itself to regimenting the home market. It sells to large purchasers—automobile manufacturers, office buildings, manufacturers of electrical goods—by contract, although delivery may be made by its agents. With such concerns its relations are continuous and not immune to the reciprocity which prevails in big business. In the sale the quoted price is maintained; yet a discount may lie concealed in some term of the bargain or in another transaction between the parties. The public buys in open market from retail outlets—department, hardware, electric

¹³ Yet the arrangement may well be subject to antitrust action under sec. 73 of the Wilson Tariff Act, 15 U. S. C. A. S. which states: "Every combination, conspiracy, trust, agreement, or contract is hereby declared to be contrary to public policy, illegal, and void when the same is made by or between two or more persons or corporations either of whom, as agent or principal, is engaged in importing any article from any foreign country into the United States, and when such combination, conspiracy, trust, agreement, or contract is intended to operate in restraint of lawful trade, or free competition in lawful trade or commerce, or to increase the market price in any part of the United States of any article imported or intended to be imported into the United States * * *". The non-export clause in the licensing arrangement raises an interesting question. Is a contract not to export an agreement in restraint of trade? And, on another plane, if the Constitution forbids the Congress to impose a tax on exports, how is a restraint upon exportation by private understanding legally to be justified? Compare also the practices in vogue in respect to radio amplifiers as revealed in the case of *General Talking Pictures v. Western Electric*, 305 U. S. 124 (1938), pp. 84-85 above.

supply, five-and-ten, and drug stores—which have been appointed as distributors. Almost all of these are designated “A” agents, who are permitted to sell only to the general trade. A few are known as “B” agents, who sell to “A” agents, to certain consumers named by General Electric, and to some of the large purchasers bound to it by contract. The “B” distributors, who in 1938 numbered some 500, are without doubt genuine agents. But to apply the same time to the 68,000 retail outlets is to invoke a legal sanction to justify remote control. In whatever fiction of the law it may be set down, the goods are in fact sold by the producer to the retailer; and the arrangements between the parties, save for the use of the word “agent,” are those of sale. At the time the scheme came into being, the manufacturer wished to fix the resale price and the law forbade;¹⁴ the magic of agency was invoked to retain title and all the rights which go with it until the sale to the user had been made. In accordance with its agreement with General Electric, Westinghouse has established an identical scheme of marketing. The other concerns licensed to manufacture may sell outright to distributors; the small trickle from the factories of the independents goes directly to the retailers.

A mercantile magic lies in the legal word “agency.” Its necromancy was intended to enthrone a practice which the fair trade acts later pronounced lawful. The investment of the manufacturer stops sharply at the bounds of his own demesne; his authority reaches out to encompass the whole market. He escapes the risks, yet fixes the prices of the goods and secures to himself the channels of trade. Sales of large lamps are made by General Electric and Westinghouse on assignment; the title flits directly from manufacturer to consumer, passing the retailer by.¹⁵ The companies issue standard lists, which enumerate types and sizes and specify the resale price of each. To “agents” allowances of from 27 to 43 percent are made in graded discounts, depending upon the aggregate value of sales in a given period. A proviso of the schedule allows a discount of 20 percent upon all lamps in standard packages to purchasers not under contract.¹⁶

The trend toward standards has shaped the price list. Until a new antitrust suit recently appeared in the offing,¹⁷ the retail price for most types of lamps of 100 watts or less were 10 and 15 cents. These prices applied to about 90 percent of all large lamps sold in the United States. Although relative efficiency is not accurately to be measured, these prices are clearly lower than for similar lights produced elsewhere. An exception is Japan in which a 60-watt lamp sells for about 7 cents in American money. Here and there small producers establish their own retail prices, usually at a figure a little lower than that set by the two dominant concerns.¹⁸ General

¹⁴ The arrangement antedates the fair trade acts of the several States and the Miller-Tydings amendment to the Sherman Act.

¹⁵ See the discussion of *United States v. General Electric Co.*, 272 U. S. 476, pp. 80–82 above.

¹⁶ The fiction of agency demands the term “discount.” As a sale the equivalent would be set down as a mark-up.

¹⁷ A new list just issued quotes lower prices. It probably reflects, not only the impending threat of antitrust, but also the trend towards fluorescent lighting. A parallel incident is the recent drastic cut in the prices of phonograph records. In the latter case the article had doubtless been priced out of its market, but the threat of music-on-films was a contributing factor. It is of note that in both instances the new technology is the property of concerns who own the old.

¹⁸ A small differential, in favor of the independent or the unadvertised brand, is a widely prevalent usage of American business. In a case respecting milk, it was by the United States Supreme Court held quite proper for a legal sanction to be given the lower priced milkman who is at a competitive disadvantage in the market.

Electric and Westinghouse alike exact a rigid conformity to schedules. Each of the two independently expresses its will; the schedules differ in form, style of type, printer's flourish. Yet by some higher telepathy the prices recited are identical.

The reason, of course, runs back through a scheme of licenses, to "the exclusive right" in an industrial art. The original Edison patent expired in 1896. An addition of a trio of basic inventions made by outsiders renewed the armament of legal sanctions.¹⁹ At the moment the patents which fence in a closed preserve may be described as improvements upon improvements. As the original idea is elaborated into greater and greater detail, a single letter is succeeded by several, and each of these gives way to a number. There is extant today no single patent for an electric lamp or for the process by which it is made. The grants from the Government are for component parts or fractions of them, for steps in the process of production or variations, great or small, near or remote, upon those steps. The sanctions upon which the scheme of marketing rest are the patents accumulated during the last 17 years. To the use of all of these, six companies have been given access; the Westinghouse company is known as "A" licensee; the other five, as B licensees.

The "A" license was granted by General Electric to Westinghouse "as of" the 1st of January 1927.²⁰ It is "non-exclusive," embraces several hundred patents, and provides for the addition of all added during the term of the agreement. The arrangement is to continue not only during the life of the patents held at the initial date, but so long as any patent resulting from an application then pending remains alive. It provides that sales by Westinghouse must not exceed 25.4 percent of the total sales of the two companies.²¹ Up to this amount Westinghouse is to pay General Electric a royalty of 1 percent; and, if the specified quatum is overrun, the royalty is stepped up to 30 percent of the aggregate receipts from the excess in sales. The "leadership" of General Electric is acknowledged; it has authority over prices and terms of sale of its cooperative rival. In the unorthodox competition, the licensee cannot offer greater compensation or more favorable terms to his distributors than the patentee from whom he derives his right. Nor is he free to choose his own retail outlets; the licensee cannot appoint "as agents persons or companies of whom the licensor affirmatively disapproves as being irresponsible representatives." Conformity is, of course, the test of responsibility. Nor is the overlordship of General Electric limited to its own affairs. It not only has corporate access to the Westinghouse patents, but it can also grant rights to their use to its own licensees. The recipients, however, in their production are not to exceed the amounts they were allowed to sell on the last day of the calendar year 1927. In the agreement

¹⁹ In 1912 the Just and Hanaman patent covering the use of tungsten filaments was acquired; in 1913, the rights in the Coolidge patent which increased the ductility of the tungsten wire. Three years later General Electric was assigned the Langmuir patent which substituted for the vacuum inside a non-incandescent gaseous atmosphere. A combination of these three patents furnished a lamp of greater intensity with a lower energy consumption.

²⁰ There was a preceding agreement whose terms were not substantially different. The agreement of 1927 was a solidification of General Electric's position. In it the company capitalized its legal victory of the year before. *United States v. General Electric Co.*, 272 U. S. 476 (1926).

²¹ To be quite exact it is 25.441 percent. It has been impossible to discover just how this figure was arrived at. In all probability percentages were worked out from sales in some preceding period taken as a base.

the grant of the license by Westinghouse is set down as "part consideration" for the license which General Electric gives in return.

A much less elaborate understanding marks the "B" licenses. Uniformly they limit sales to a specified percentage of that of the issuing company and upon such a volume provide for a royalty payment of $3\frac{1}{3}$ percent. If, in any calendar year, any licensed concern exceed the specified amount by more than 5 percent, an additional royalty of 20 percent is imposed upon the excess as penalty. In these agreements no prices are fixed by General Electric; but royalties are based upon a general schedule which serves alike as a warning against "chiseling" and as a reminder of what prices are reasonable. Finally, as with many well-known goods produced for chains or mail-order houses, the trade-mark is withheld.²² Although he employs the process, the licensee is not permitted to use the name or symbols of the patentee, such as "G. E.," "Mazda," or "Edison." The prohibition comprehends advertising, sales, and the ware itself.²³

All of this was, or at least was formally in legal issue in the *General Electric case*.²⁴ Although the court's decision²⁵ left its marketing arrangements undisturbed,²⁶ the company proceeded to fortify its already fortified position. The corporation was already the owner of three patents—one of 1912 to Just and Hanaman, the basic patent for the use of tungsten filament in the manufacture of electric lamps;²⁷ the

²² The manufacture by Goodyear of tires to be sold by Sears, Roebuck under another trade name is the classic example. *F. T. C. v. Goodyear Tire & Rubber Co.*, 304 U. S. 188 (1937); 191 Fed. (2d) 626 (1939); certiorari denied 308 U. S. 188 (1939).

²³ A brief summary of the restrictions imposed by General Electric upon its licensees may be set down in the margin:

(a) The licensee agrees to limit production according to an express formula. Penalties in the form of increased royalty payments are imposed for failure to observe the quotas established by covenant. Under certain conditions the patentee's license may be revoked.

(b) The licensees agree for the duration of the covenant to admit the validity of any General Electric patent included within the arrangement.

(c) Royalties paid to General Electric are imposed not upon specific patent grants but upon "sales" of the unpatented incandescent lamp.

(d) In the case of "B" licensees "sales" consist of the total number of lamps produced. Actual sales by the "B" licensees are unimportant in the computation of royalty payments.

(e) Royalty payments for "B" licensees are based upon a percentage of the retail price charged by General Electric in disposing of its own lamps. "A" licensees covenant to observe General Electric terms, prices, and conditions of sale in computing royalty payments.

(f) "A" licensees are subject to the same distribution plan as is followed by General Electric. An "A" licensee may not select as a distributing agent anyone of whom General Electric affirmatively disapproves.

(g) Licensees are not permitted to dispose of any independent element used in the construction of the incandescent electric lamp, presumably whether this element is covered by a General Electric patent or not.

(h) Licensees are required to refrain from producing or manufacturing light bulbs, tubing, or caneglass.

(i) Licensees agree to license to General Electric all patents useful for the production of the incandescent electric lamp. General Electric, in turn, can license these to its sub-licensees. "B" licensees agree that their cross-licenses shall continue for the duration of the patent grant so licensed despite the possibility of an intervening termination of the basic General Electric agreement.

²⁴ *United States v. General Electric Co.*, 272 U. S. 476 (1926), and see pp. 80-82 above.

²⁵ It is rather interesting that the decision represents a position far more favorable to resale price maintenance than even the National Recovery Administration was willing to assume. What the fair trade laws have done is to obliterate the distinction between sale and agency and to put back of the trade-mark the sanction accorded by the courts to the patent.

²⁶ Some time before it was put into effect, General Electric submitted its system of "agency" to the Department of Justice for an opinion upon its validity. The official answer was so hedged about with silences and peradventures as to be noncommittal. A lower court rebuked Justice for letting the matter pass when its attention had been called to it, and the United States Supreme Court held it, at least as a point in the corporation's favor, that the Government had not acted. An argument that weighed heavily with the bench was that under valid patents Westinghouse held its rights from General Electric, and that equity commanded protection for the price structure of the patentee against a possible break-down by its own licensee.

²⁷ The Just and Hanaman patent on tungsten filaments, antedated by the invention of a metalized carbon filament in 1904, proved twice as efficient as previous conductors. Its fragility militated against general use, however; and it remained for Coolidge to add improvements making production commercially feasible. The Just and Hanaman invention had its origin in Austria-Hungary and was assigned to General Electric in 1912. The patent on the improvement, a contribution of Dr. William D. Coolidge, a member of its research staff, was assigned to General Electric in 1913.

Coolidge patent of 1913, covering a process of manufacturing tungsten filaments, by which their tensile strength and endurance is greatly increased; and the Langmuir patent issued in 1916, which is for the use of gas in the bulb by which the intensity of the light is substantially heightened. The three patents cover completely the manufacture of the modern electric light with the tungsten filament and secure to the General Electric Co. the monopoly of their making, using, and vending. The three patents, powerful as they were as props, were not possessed of life everlasting; they were due to expire in the years 1929, 1930, and 1933 respectively. So to them was added the Pipkin process, by which through a double method of etching, the inside of the bulb was frosted, thus increasing its tensile strength by some 20 percent and at least changing—if not improving—the quality of the light. The application had made no claim of a new method for creating the inside frost; it asserted only that its employment with certain types of glass containers created a new result. But where invention left off, advertising could be invoked to carry on. A notion was implanted in the public mind that without frosting no lamp was fit for its function, and against a general belief it was impossible for an independent to go. And since licensees were expressly forbidden to manufacture glassware for use as bulbs, they were forced to obtain the product upon General Electric's terms. As a further bond in the maintenance of an alliance of corporate estates, the right to produce the frosted bulb was assigned to Corning, who denied the product to all but General Electric licensees. The company has shifted its strategic base from filament to frosting. By the Pipkin patent claim is laid to every frosted bulb and to every process of frosting which meets minimum specifications for strength and brightness. It was only after repeated objection that the application was granted; yet its validity has withstood the technical ordeal of litigation.²⁸ Economic necessity and the cordons of contract support a great adventure in industrial cooperation.²⁹

The hope of overthrowing the system of marketing by a thrust at the patents upon which it rests is likely to prove illusory. The Pipkin patent is now little exposed to attack. If an action for its cancelation should be brought by the Government, it would be little more than the initial attack in an arduous and protracted campaign. If it should prove successful, General Electric has only to rest its license, with its imposing edifice of conditions, upon a series of other patents. If

²⁸ On tests in two district courts, the patent was found invalid. In each instance the judgment was reversed upon appeal by the circuit court. Since the two circuits did not disagree, no appeal lay to the Supreme Court.

²⁹ General Electric was not the only beneficiary of its legal victory. The path opened—or at least not closed—by the Court's decision was plainly marked. Among the first to capitalize upon judicial utterance was the optical goods industry, which revised its licenses to include fixed vertical price schedules for patented wares. To secure compliance with contracts on the part of firms tempted to chisel, an elaborate system of espionage is set up. A far-flung campaign of advertising established consumer acceptance for its products. Those who passed along the goods either kept faith with their superiors in respect to price schedules or presently they departed the business.

The Phelps-Dodge Corporation possesses exclusive rights in the B-X cable. The article is patented; when manufactured it is armored and employed in transmitting electrical impulses. The grant is held by a subsidiary of the corporation, the National Electric Products Co., which issues licenses to various producers of electrical equipment. Among restrictions imposed are zone prices established upon all products distributed within the United States. In any territory the prices charged by all manufacturers are the same; the differentials in transportation due to different points of origin are absorbed by the producers. Firms may compete for customers, but uniformity in schedules of delivered prices makes it impossible for consumers to shop around for better bargains. The patent may or may not be valid, the marketing arrangements not beyond legal question. Yet the popularity of the cable and the dominant financial position of the patentee prevent the restrictive covenant from being questioned in court.

this should fall, the company still is not caught short on defenses; the ease with which new patents are granted insures no failure in the line of supply. So long as the current electric light endures, and variations may be rung on its simple theme, there can be no dearth of sanctions. For the possibilities comprehend patents on the product, patents on the process, patents on the machinery which support process and product. The defense could even retreat beyond the electric-lamp industry itself. The patents which converge upon the Corning bulb are a strategic height far in the background; an independent could not reach a sizeable volume without access to intricate machines; the things that make the things that make the incandescent bulb are a kind of house that Jack built. The fluorescent lamp, resting upon another principle, offers a competing technology; but somehow patents to the new process have fallen into the hands of General Electric.³⁰ As the art of lighting develops, it has the resources for the long fight; it can continue indefinitely to lose battle after battle and still win the campaign. Even a sudden and radical shift in technology need not bring to it an imminent threat.

If, however, patents are not vulnerable, there are other points of attack. It can be urged that the grants do not cover the finished product but only the elements from which it emerges. It would seem to follow that, so far as the patent is the sanction,³¹ General Electric cannot fix the price of the Mazda lamp, but only of its several parts. It is, therefore, outside its legal orbit in fixing the prices of lamps sold by Westinghouse and its own retailers. It is, likewise, currently open to question whether the agency which saturates the marketing channel is genuine. If the term is no more than a mask behind which to hide price-fixing and is wanting in the substance which distinguishes buyer and seller from principle and agent, the credentials of the vending vicar may have vanished into thin air. Lastly it may be urged that the grant—no matter how unquestioned its validity—carries no authority to abate competition between licensees or to regiment their affairs. The exclusive right, like the power of the Patent Office, stops at the line marked out by the general law.

Along one of these three paths will proceed any future attack upon the legality of the General Electric's marketing system. No one seriously challenges the value of bigness in an industry exploiting to the full quantity production and the assembly line. But bigness is finite; and the question is where, as the instrument of low unit cost, its limit lies. If the giant corporation rode to market on efficiency alone, it would be under no necessity to hedge in its channels against invasion by the independents. It could charge reasonable royalties upon genuine inventions and leave to the independents—with small factories and limited arteries of distribution—their own salvation. In an entrenched position, fortified by gigantic resources, General Electric should be immune to competitive dis-

³⁰ A question alike of legal interest and of concern to the general public, is whether the antitrust acts allow or forbid the ownership of competing technical processes by the same corporation.

³¹ It is to be remembered that in the *General Electric case*, the right to fix the resale price is grounded upon agency and the validity of the license contract. The patent is subsumed, since only through the exclusive right which it confers is the patentee able to dictate his conditions. The fair trade acts might be used by General Electric as a defense unless they contain provisos limiting their application to trade-marked goods which are in active competition with non-trade-marked goods. In an antitrust suit, no such defense would be available, since the Miller-Tydings amendment contains such a proviso.

advantage. Its studied attempt to impose handicaps upon its rivals raises a presumption against its profession of efficiency.³²

There is here no quarrel with the primary intent of the patent law. The inventor—or his assignee—is worthy of his reward. The issue starts where privilege is pushed beyond the royalty. If the licenses issued by General Electric were stripped of their regulatory features, a free market might be restored to electric lamps. If, instead, it should prefer not to license at all, but to retain all manufacture within its own hands, the same result might follow. Independents would challenge the validity of doubtful patents rather than face extinction. Or they would take inventions whose patents have already expired and graft upon them ingenious improvements of their own. The refusal to deal might give a powerful stimulus to the development of some alternative method for the conquest of darkness. Science has many leads to offer; and a closed door might be a signal to adventurers to follow them. It may be that the gas-filled bulb should long ago have become obsolete. If fluorescent lighting is ever given a fair chance at development and access to the market on terms which allow real competition, the Mazda lamp seems headed for the museum. And who can say what illumination might follow some lead which the laboratories already offer.

The advantages of large-scale production are fixed by the technical process itself. In automobiles—the case which has become classic—there are three large concerns. In electric lights a single corporate control lies heavy over a large number of factories. A change in marketing arrangements demands no revision of the system of production. A return to competition decrees no pulverization of the industry into small bits. The fealty of the manufacturer rests upon conditions in his license which have little to do with putting an invention to work. The bondage of the retailer derives from a subtle distinction which the court has been persuaded to play with the word “agency.” The marketing scheme fails of validity by reference to its derived intent of promoting the progress of the useful arts.

BERYLLIUM AND FOREIGN POLICY

As a metal with a past, beryllium goes back to the days of Nero; as an article of commerce, its history covers a scant decade. A promoter, Andrew V. Gahagan, set out to develop synthetic metals; in 1930 a staff in his employ added small quantities of beryllium to copper and nickel and developed alloys of astonishing properties. A chisel of beryllium-copper can cut structural steel and has three times the tensile strength of duralumin, the metal previously best adapted to airplane construction. A 1-inch bar of beryllium-nickel can support a load of 150 tons, and springs made of it have never been broken by fatigue. A watch composed of these alloys has been dropped from an airplane at a height of 3,000 feet and only the crystal had to be replaced. An exploitation of the properties of beryllium alloys has been a recent triumph of German airplane manufacturers.

³² As this goes to press, the Antitrust Division of the Department of Justice has begun *United States v. General Electric Co.*, District Court for District of New Jersey, Civil No. 1364, alleging that 12 corporate defendants have combined to fix noncompetitive prices, to restrict production artificially, and to control the business of independent manufacturers.

The metal, the fourth lightest of all elements, is found in many ores, the deposits of which are quite widespread. The methods by which it can be isolated and purified are reasonably inexpensive. The great barrier to its commercial use has been the difficulty of fusing it with other elements. Its specific gravity is only half that of water and when melted it tends to float upon the surface of other molten metals. It was the pioneer work of Gahagan's technicians which in this country opened the door to industrial use.

When patents were applied for, Gahagan discovered that Siemens & Halske, one of Germany's most powerful corporations, had preceded him. Through its subsidiary, Hereus Vakuumschmelze, it had secured patents on processes leading to the same result. When Gahagan sought "cooperation," to avoid a long and costly struggle in the courts, he discovered that the foreign concern had assigned all its rights to the Metal & Thermit Corporation, an American company. The transfer was purely nominal. The German firm had feared discrimination against aliens in the Patent Office and had taken steps to push forward their claims under domestic auspices. Gahagan, however, took the fiction for the reality; persisted in overtures to Metal & Thermit, who were powerless to deal; discovered after 3 years where real ownership lay.

Once informed as to the situation, Gahagan found it easy enough to come to terms with his competitors. Through a deal consummated in Germany, the two parties made their patents mutually available; each agreed to pay to the other a royalty on his sales. In a division of the world market Gahagan received exclusive rights in America and Siemens was given a free hand in Europe. Thus for each of the provinces, and without an act of Congress or any legislative body, a tariff wall was erected. The American corporation had the hemisphere to itself, enjoyed protection against all rivals, was independent of foreign competition in fixing of prices. In return it was compelled to sacrifice sales abroad, to abandon an outlet for the products of American capital and labor, and to forego a plant expansion which later might have proved a national asset. The threat of litigation conspired with the usages of license to convert an international competition into two land-locked domains.

If the United States has condoned so vagrant an employment for patents, some other nations have been less tolerant. Some time after the agreement, when Gahagan was on his way to Germany, he was requested to stop in England. Although he knew of no British holders of his securities, he complied with the request. Then for the first time he discovered that one of his directors was holding stock for a Mr. Jamieson, the chairman of the board of the Vickers Co., a dominant concern in munitions. Jamieson, he discovered, had knowledge of his arrangements with Siemens which he had assumed to be quite secret. Jamieson stated that, if a war should cut off the supply of tin from Bolivia and the Malay States, beryllium could be used as a substitute—hence that it was of great military importance to Great Britain. He announced that Vickers, Rolls-Royce, and other manufacturers of armament were willing to purchase from the United States, but did not choose to become dependent upon any alien European cartel. Therefore Jamieson demanded that Gahagan abrogate the provision in his agreement with Siemens which forbade American production for, or sale in, the English market. When Gahagan protested his

inability to escape the obligations of contract, Jamieson replied that he would take care of it.

The words were no idle boast; at once the question moved from a corporate to a semidiplomatic level. A little later when Gahagan went into conference with his German associates, the initiative was taken by one Frederick Giller, an "unofficial representative" of the British Government. If the market in the United States was closed to it, England intended to develop its own beryllium industry. It was true that the patents which it had granted to Siemens were an obstacle; and, since the country was not at war with Germany, it could not confiscate them. But recourse could be had to a statute which provided for a compulsory license to make, vend, and sell where the patentee suppressed his invention or neglected to go into production.³³ At this threat the Germans—with the reluctant concurrence of their government—agreed to the proposed modification of the contract. The Beryllium Corporation of America was permitted to sell to a British company which in turn was to sell to the British armament makers. Nevertheless, the victory for Britain was not complete. Siemens reserved to itself the power to cancel any order of which it disapproved.

All was quiet along the international front until England's declaration of war. The British Isles became a province of American beryllium; orders were placed and delivered; the commerce fell into a regular groove. But, as hostilities began, the German veto came into play. Siemens stood on "exclusive rights" granted by the United States Government; the Beryllium Corporation was its licensee; the contract recited the conditions of manufacture and sale; the patentee's veto over shipments to Great Britain was clearly denominated in the bond; if the terms of its license were flouted, it would institute suit for infringement. The Beryllium Corporation apparently is selling to England despite this order from Siemens. It therefore faces a possible suit for infringement or injunction whenever Siemens decides to act. Thus a private understanding, resting upon letters patent, was in effect allowed to insert a proviso in a Federal statute. An act of Congress allows the business firms of the country to sell to any nation, provided the buyer comes here, pays cash, and carries the goods away at his own risk.³⁴ The amendment, inserted without being referred to the two Houses, allows one nation to veto shipments to another nation with which it is at war.

In the meantime American beryllium moved along a tortuous path. It was, if not the metal, at least a metal of the future. A number of enterprising individuals began production. None were of a size to challenge the Beryllium Corporation, and it was too busily engaged in pioneering to seek to eject petty trespassers.³⁵ Now Ga-

³³ Patents and Designs Act of 1907, § 27.

³⁴ Neutrality Act of 1939, as amended, 22 U. S. C. A. 2451.

³⁵ Note in the Hearings of the Temporary National Economic Committee, Part 5, p. 2049, the following colloquy:

"THE CHAIRMAN. Do you wish the committee to understand the Beryllium Corporation is not enforcing its patent rights?

"MR. GAHAGAN. We haven't tried to yet.

"THE CHAIRMAN. Do you intend to?

"MR. GAHAGAN. Yes, sir.

"THE CHAIRMAN. And if and when you do enforce those patent rights, you will practically have complete control of the industry, is that correct?

"MR. GAHAGAN. That is what I hope to have.

"THE CHAIRMAN. And these competitors could not compete with you unless they had a license from you, assuming that the courts upheld the facts?

"MR. GAHAGAN. That is right."

hagan has indicated that there is a limit to his patience; but his confidence in the character and broad boundaries of his grants is not shared by all the members of the trade.³⁶ And, until they are subjected to the fire of litigation, it is impossible with accuracy to define his rights.

If Gahagan should invoke the law, he is likely to encounter difficulties. The Masing & Dahl application, filed by the German affiliate, was originally written to cover the heat treatment of beryllium-copper, no matter what other metals might be added. In an interference proceeding, however, the Patent Office limited the claims to exclude any other metal whose addition substantially altered the properties of the alloy. Moreover, at the same time, a patent was granted to a certain Corson for the treatment of beryllium-copper containing nickel. This patent was assigned to the Electro Metallurgical Corporation, a subsidiary of Union Carbide & Carbon, under whose license, Brush conducts its business. Since Brush does not sell to fabricators who employ the Masing & Dahl process, it does not regard itself as vulnerable to Gahagan's attack.

Although the law has not been invoked, there have been rumblings of an impending conflict. As early as 1935, one Ferdinand A. Kertess, the American representative of Deutsche Gold- und Silber-Scheideanstalt, which had purchased Siemens' beryllium interests, wrote to Dr. Sawyer, of the Brush Corporation, suggesting "privately" that "it would be a good thing for all of us" if, like good Americans, Brush and Gahagan should get together. He suggested that one of the concerns should produce beryllium and the other manufacture alloys. Such a division of products promised "extensive profits" to all concerned. He was careful to state that the objective of his proposal was not "the elimination of competition" but rather "scientific cooperation" and "lower costs of research."³⁷ Then with a rhetorical flourish, he reminded Sawyer that his rival held "important key patents"; insisted that "for the moment it can be disregarded whether such possessions meant a tight monopoly"; and warned that for "another manufacturer" to "disrespect them" would "certainly" involve "lots of trouble and cost." But Dr. Sawyer was uninterested; as yet litigation did not impend—and there were the antitrust laws.

A little later another attempt was made to bring the folkways of the German cartel into the American industry. On this occasion the apostle of cooperation was a Dr. William Rohn, a pioneer in beryllium. He had graduated from scientist to head of the Heraus-Vacuumschmelze Co., a subsidiary of Siemens. In a conference Sawyer was told by Dr. Rohn that Brush had been guilty of unethical con-

³⁶ Dr. Charles Sawyer, of the Brush Beryllium Corporation, Hearings of the Temporary National Economic Committee, Part 5, p. 2137.

³⁷ Note the persistence with which Kertess clung to the cause of science:

"Mr. ARNOLD. Then you say if you, for instance, could come to a comparatively loose agreement with Beryllium Products Co., your company handling the matter, do you mean handling the matter refers to research?"

"Dr. KERTESS. Yes.

"Mr. ARNOLD. Or whether you could make up your mind to acquire shares, you have to acquire shares in order to protect the research?"

"Dr. KERTESS. Yes.

"Mr. ARNOLD. And you also meant by the word profits, research?"

"Dr. KERTESS. Yes.

"Mr. ARNOLD. So handling the metals, handling the alloys and acquiring shares and profits all refer to research?"

"Dr. KERTESS. Only."—Hearings, Temporary National Economic Committee, Part 5, p. 2075.

duct; that it had sold products in the European market at prices below those quoted by the Continental cartel; that its behavior at home was little if any better than abroad. The insistent Dr. Rohm boasted of effecting a merger between five or six British companies and cited as proof of his magic a 30-percent increase in the prices of their products and regular dividends. Dr. Sawyer was no more moved by an appeal to profits and the proprieties than by the former argument for research.

But, while impulses from abroad played upon Sawyer and the Brush company, its competitor was not idle. American Beryllium was busied with the promotion of its products. An obvious customer for its copper alloy was the American Brass Co., the fabricating subsidiary of Anaconda Copper. An agreement between the two parties made American Brass the exclusive outlet of Beryllium Products for a term of years and fixed the price at \$25 per pound. After 2 years, as a prod to its own salesmen, American Brass permitted purchase by the Riverside Metal Co., a competitor. Then a misunderstanding brought a cloud over the agreement. In spite of a clause providing for a reduction as volume increased, American Brass boosted its price for the fabricated metal. It also announced that it would purchase no more alloy, since the stock on hand was enough to last a year. When Gahagan protested, another motive came into the open. He was told that American Brass was not interested in pushing a product which would compete with its established business in phosphor bronze. Its prices for sheet, wire, and rods fabricated of beryllium-copper give evidence of keeping the faith with its own product. In spite of sharp decreases in the price of the alloy itself, they show an upward trend from 78 cents per pound in 1932 to \$1.10 and \$1.30 a pound in 1939.

The outlet for the new metals was through the copper industry. American Brass dominated this market; the ways of the trade made it the price-leader. Riverside, the other important fabricator, had no alternative but to follow the prices, without regard to its cost or profits. In 1939 American Brass delayed adoption of its new price-lists until the matter had been thoroughly discussed with the president of Riverside. The executives of the companies agreed that the future of beryllium-copper depended upon a reduction in price down toward that of phosphor bronze. One witness testified that there was a proposal to pass on to the consumer 10 cents of the 18 cents reduction in the cost of the alloy. A representative of American Brass could recall mention of no such figures. The exchange of price-lists was freely admitted; a letter in the files of American Brass referred to a list of "recommended" prices as having been "suggested by" Riverside's president. The market for Gahagan's product had, through the usages of patent and license, been played into the hands of parties interested in a competitive product.

Along with this came another discouraging blow. After it had become an accomplished fact, Gahagan learned that Brush was selling to American Brass. As a consequence, he was forced to reduce his prices to Riverside and other customers. Since these reductions have not been passed along, the effect has been to divert income from Beryllium Products to its vendees. Accordingly the concern contemplates an extension of its operations into the field of fabrication. Although this may increase the demand for beryllium, it will not relieve the pressure of Brush's competition. The antidote is a vigorous campaign

for infringement against all fabricators who employ Gahagan's heat treatment without coming to terms¹ with him, taking his license, and purchasing his beryllium. As yet this has not been undertaken; but the moves by Kertess and Rohm toward cooperation indicate that parties who may be concerned regard the threat as ominous.

Here is a case of an infant industry. A number of synthetic metals, possessed of an unusual combination of qualities, promise to win for themselves a large place in the operations of industry. The products are of great significance for a program of national defense. It is imperative that experimental work go forward: that future need be anticipated in plant capacity; that, when emergency impends, the trade shall be ready to deliver. Here is a distinctive opportunity for the patent system to perform its office in the national economy. Yet, from this instance alone, a glowing testimonial could hardly be written to its capacity to promote the progress of science and the useful arts. Its work is most manifest in the realm of foreign relations. Official grants have served as a foundation for an international cartel which has divided territory, restricted output, fixed prices. It has created a pawn to be caught up in the game of competitive nationalism. At home the new metals have come under the control of concerns whose dominant interest is in enlarging markets for old ones. A rivalry between Gahagan and Brush, in the production of beryllium, is short-circuited by the solid front maintained by the fabricators. A domestic situation, in which the privileges accorded by patents are set against closed channels of trade, gives a strange twist to the competitive design.

The competition is itself an anomaly which marks the youth of the industry. The relation of Beryllium Products and Brush will not bear reference to any norm of expectation. At home patents are a continuing threat to any independent who incurs the disfavor of Gahagan's company. Yet so far the threat has not developed into the action. The conduct of the larger concern still reflects more of the pioneer than of the promoter; the company is still far more a personal venture than a corporate instrument of money-making. The validity of the patents has not yet been verified by litigation; no statement of their scope can be set down with certainty. The atmosphere which envelops is not one of brotherly accord, yet every party in interest hesitates to touch off a lawsuit. All know that litigation will demoralize the industry; that the issues will drag wearily through the courts; that, by reference to technical standards, the outcome is unpredictable. It is only through such a preponderance of resources as to exhaust adverse parties that certain victory is to be won. As like as not unity will come from without. The situation is ripe for the appearance of a mighty corporation which will wield the technique of high finance in the cause of the united front. It will stake out an estate, consolidate claims, pocket the reward decreed by the law for the inventor. A great market beckons, certificates of privilege are in circulation; American business will prove untrue to the spirit of acquisition if it fails to turn opportunity to account.

CHAPTER VII

THE POLES OF TRADE PRACTICE

THE GLASS CONTAINER—THE PATENT AS POLICE

The glass container against the automobile throws patent practice into sharp relief. One industry has exploited fully the official grant which the other has regarded somewhat as common property. The two cases mark the extremes; between them lies almost all that is comprehended in current usage.

The gentlemen in the glass container industry have long been desirous of security. The raw material is to be found almost everywhere; the capital required is not excessive; labor which can be fitted to the task is widely available. And, in spite of the formidable appearance of the machine, the art of bottle-blowing is comparatively simple. All of the requisites, save one, are in easy reach of all comers. Were technology free, the industry would be wide open—and probably as chaotically competitive as women's dresses or bituminous coal. Yet, because of the closely guarded process of fabrication, a fence shuts in the industrial domain. A number of units—which once were inclined toward trade war—have found their places in an empire which bows to a single authority. Hartford, home of the Hartford Empire, is the capital; Corning, of the Houghton Associates, and Muncie, or "Middletown," of the Ball Brothers, are leading provincial cities. And Washington, D. C., the domicile of the Patent Office, is a kind of treasury, too remote to disturb with a will of its own, yet near enough to supply every necessary support to an entente cordial which runs on.

The glass container is a commodity after its own kind. It is not, like dates, or pork, or hides an article which nature provides. It is not, like cloth or shoes or spectacles, fabricated to serve a distinct human need. It did not, like ice cream, the radio, or tobacco create its own demand. Instead, goods of many kinds had to be packaged or they could not go to market, and the instrument of glass, because of cheapness or convenience, replaced other containers of wood, paper, or metal. The article, accordingly, enjoys an unearned increment created by forces not of its generation. The canning of fruits and vegetables on the farm called forth the Mason jar. The decree of pasteurization outlawed the peddler's dipper and evoked the glass bottle. The coming of prohibition drove the outlawed liquid from mug into receptacle and stimulated the sale of bottled soft drinks. Repeal brought back—not the pitcher and the family entrance—but the beer bottle.

A primitive art, resting upon "blowing by hand," could hardly withstand such social trends. As early as 1905—a point of time more than twice the life of a patent away—Owens had developed an auto-

matic suction machine for making glassware; a little later Hartford-Fairmont patented a gob-feeding device which served the like purpose. At the same time Corning was perfecting a machine process for making glass bulbs. The three large concerns did not have to create a market for their products; they had only, with the rights which their patents gave, to go forward and possess it. They had little to fear from others; for the ancient art could not compete with the new technology. They did not, except to keep their grants alive, have to improve their methods. The only threat was a practical substitute; and it was slow in coming.¹ The companies could—so long as basic patents were periodically refreshed—continue to supply a rapidly expanding market. If neighbors should attempt to barge in with the same process or product, the courts could be invoked to arrest the trespass. A stop was called to all competition from outsiders—in glass containers or in glass machinery. The field belonged to the three; and, had they chosen, the Titans might have battled for possession.

Each cast longing eyes over the whole of the promised land—but in the end they did not so choose. A sharp boundary was drawn about a great empire by the series of patents; the companies had to appoint their own lines between provinces or leave them to the courts. In driving into the other fellow's territory the stakes were high but the costs and hazards were heavy. It was a game at which all could play; every foray was sure to be followed by reprisals; offense was certain to be the best defense. In 1915, Corning and Hartford bowed to the cost of litigation; a cross-licensing agreement gave to Hartford the field of glass containers and to Corning the realm of bulbs and specialty wares. The rapprochement presently led to an *anschluss*; and in 1922 the two concerns entered into a full-fledged pooling agreement. At the time, Hartford-Fairmont was reorganized as Hartford-Empire; a controlling interest, 59.5 percent, in the new venture went to the stockholders of the old Hartford-Fairmont Co.; 40.5 percent went to the Empire Co., a subsidiary of Corning, which in turn was controlled by the Houghton family. Their minority interest, however, received recognition in the right to name four of the nine directors of the new corporation. The common accord, in respect to production and price, was continued. The first act in the welding of the empire was complete.

Owens, however, had to be faced and Owens occupied strategic heights. It had found that Hartford's gob-feeding process was a menace to the sales of its suction machinery; so it had begun to buy up gob-feeding patents in preparation for an economic battle to be waged with legal weapons. In 1923 it instituted a suit for infringement against one of Hartford's licensees—the initial attack in an arduous and uncertain campaign. The parties took one long look at the hazardous way ahead, another at the richness of the prize to be won, and decided to divide the spoils. Except for the rights which Owens held in the suction process, each was licensed to make use of the patents of the others. As respects the suction process it was agreed that Owens should not assign its rights; Hartford should not license certain machinery without Owens' consent; Owens should not employ its patented process to manufacture products competing with Corning.

¹ The paper container has made inroads and is now displacing somewhat the milk-bottle. But it must be made far more durable and air-tight to become a serious rival. A metal container has made some headway as a substitute for the beer bottle.

As mutual consideration Owens was to pay royalties at Hartford's lowest rate; Hartford was to turn over 50 percent of its divisible income less \$600,000. The alliance was to be supported by equal contribution to a war chest which was to be drawn upon for the acquisition of patents and the prosecution of suits for infringement. The second act in the welding of the empire was complete.

Next a blitzkrieg was directed against the independents. They were harassed with suits for infringement, which kept them occupied, drained their resources, disorganized their markets. In the end they had to capitulate and accept the settlement dictated by the alliance. Their patents—not yet invalidated by litigation—were taken over by Hartford. Such as were left in business were compelled to accept licenses from Hartford and to pay a tribute of which Owens received a share. In instances the threat of a bout at law was enough; in others independents or their customers had to have their days in court before they were willing to capitulate.

Along with these events went a move to domesticate the patents to the acquisitive arts. A research staff, widely publicized as an instrument of technical advance, was given the task of improving the processes of production. All innovations were duly patented, but not so promptly put into effect. As others came forward with inventions, Hartford intervened, and the proceedings were protracted until the resources of the applicant were completely exhausted. It caused its own novelties to linger around the Patent Office for years, thus deferring the date of issue and thus prolonging the life of the protection. One basic patent, for which application was made in 1910, did not emerge until 1937: thus a grant which should have run its course by 1927 retains its validity until 1954. A similar device, but fitted out with a narrowed claim, was in 1928 accorded letters patent which expire in 1945. Yet, although its life terminates then, protection runs on because of the longer grant. Thus for Hartford legal sanctions have been kept alive as the patent has been harnessed to the balance-sheet.

The venture into imperialism was vigorously pushed by Hartford and associates. After a running fight of several years, Hazel-Atlas came into the entente. The runner-up to Owens lost its independence and was assigned its place in the empire. And Hartford's divisible income—which included royalty payments on the Hazel-Atlas patents by its former competitors—was now split three ways. Next Thatcher and Liberty, large manufacturers of milk bottles, came in; agreed to pay royalties; and received preferred treatment. Next their competitors were forced to take out licenses; and, in order that the market might not be spoiled, to accept production quotas fixed by Hartford. Last of all, a preemptory invitation was extended to Ball Bros. They had long been manufacturers of fruit jars, held the dominant position in the field, and lay entrenched behind their own patents. Ball continued to use their own process; agreed to pay royalties on inventions of which they made no use; and received assurance that no new licenses would be granted which encroached on their territory. The third act in the welding of the empire was now complete.

The monopoly had been fashioned; its lines stood sharply out. Concerns with power were accorded appropriate places; the small fry were treated as nuisances to be abated. An analysis of the total

American production of glass containers reveals the design consciously wrought into the pattern of the industry. It shows Owens with 38.03 percent of the total output; Hazel-Atlas, 16.89; Anchor-Hocking, 8.01; Thatcher, 2.87; Ball Bros., 3.75; some 33 other licensees from Hartford, 27.05; and 3 independents with 3.40 percent. Thus of the total, Hartford is overlord to firms with 96.60 percent of the entire output. Of the 3 independents 2 are now being sued for infringement. And the authority of the sovereign, with its power to grant or deny access to the channels of trade, rests upon documents issued by the Federal Government.

Hartford has thus become benevolent despot to the glass container. Only by its leave can a firm come into the industry; the ticket of admission is to be had only upon its terms; and from its studied decision there is no appeal. The candidate must subscribe to its articles of faith; he must not be a price-cutter nor a trouble-maker. So long as he lives up to its rules he may run his own business as he pleases. He may be as wasteful or as efficient as he pleases within his own establishment; but he may not make his customer the beneficiary of his efficiency. He enjoys a freedom under authority; the concerns are severally members one of another; independence must not go so far as to put a brother concern in financial jeopardy.

One who seeks induction into the mystery of bottle-making must present himself before "the character committee" of the sovereign company. He must persuade it that he is a man of integrity, that his financial position is secure, that his economic ideas are sound. But, however elegant his qualifications, he can scarcely hope to be accepted unless there is room for him in the trade. For admission does not depend upon probity and pecuniary competence alone; nor is it fixed by those automatic checks and balances of the market which are "the balance-wheel of capitalism." Rather the issue belongs to the politics of industry and turns upon how much competition is best for the competitors. The company prides itself upon its complete information, its ability to gage the market, the neatness with which it accommodates its licenses to an increase in the demand for the product. Its avowed intent is, not the protection of vested interest against the newcomer, but doing nimbly and promptly what the market haltingly and clumsily would otherwise have to do for itself.²

The empire is not opposed to competition; but it seeks to further normal, and to escape "ruinous competition."³ For that reason Hartford inserts restrictive provisions in its license. Whether concerns came in willingly or were conscripted, each was assigned its deme-sne. In general, the initial standard was the status quo. Each firm was permitted to manufacture the products and was accorded the share of the market to which it was accustomed. But it is not easy to arrange a number of parts which just grew into an orderly scheme, and in the process readjustments were necessary. A number

² Note the following exchange between Mr. Hugh Cox, for the Department of Justice, and Mr. F. Goodwin Smith, of the Hartford Empire Co., before the Temporary National Economic Committee, Hearings, Part 2, p. 413:

"Mr. Cox. The effect of that kind of a policy is to protect the existing manufacturers of milk bottles from competition, from newcomers in the field, is it not?"

"Mr. Smith. No; I don't like to put it that way. It is to protect the present manufacturers, to make money, and to produce milk bottles cheaper."

³ Ibid, p. 427:

"Mr. Smith. It has never occurred to me that our policy maintains a price. I would say that our policy has prevented ruinous competition."

of companies had to give up their minor wares; the overlapping of products was reduced to trimmer lines; and members too weak to dictate terms had to be content with what was offered. Rarely was a licensee permitted to extend his former domain. To such generosity "he has no right because he has never been in the habit of producing that ware" and his business was not "in that particular line." But no absolute ban was placed on expansion. If a licensee wished to take advantage of "some particular situation," Hartford could be depended upon to do the decent and reasonable thing.⁴

The restrictions take a variety of forms. Limitation by type is universal; and containers of the same type may be distinguished by use. Fruit jars used for home canning and by commercial packers may look alike, but for purposes of the license they are distinct wares. The sale of the one for a purpose to which the other is ordinarily put would be a violation of the law of the industry. Such respect is accorded the division of labor that a concern is permitted to fabricate bottles for chocolate milk, with the condition that they are not to be sold to dairies. Precaution adds the postscript that under no circumstances are they to serve as containers to unchocolated milk. The Buck Glass Co. is authorized to manufacture wine bottles for sacramental purposes only. The operations of the Sayre Glass Works are to be restricted "to such bottles, jugs, and demijohns as are used for vinegar, ciders, sirups, bleaching fluids, hair tonics, barber supplies, and fluid extracts." Likewise Florida Glass Manufacturing Co. must fashion its containers so skillfully that they may be filled only with mayonnaise, peanut butter, preserves, sirup, and honey. Knox Glass Bottle Co. is allowed to make only amber ginger ale bottles; Mary Card Glass Co. only blue glass containers; Carr-Lowry Glass Co. only opal colored products. Hocking Glass Co. may not make products weighing more than 82 ounces; and Baurens Glass Works, Inc., is licensed to provide bottles for castor oil and turpentine, but none to exceed 4 ounces in capacity.

It is impossible to reduce such restrictions to a simple table. The criteria of classification are so numerous and so variable that an enumeration of all the instances is necessary to recite the story.⁵ Broad fields such as milk bottles, beer bottles, and fruit jars are not always left intact; narrow domains are often cut up into small holdings. A number of manufacturers are permitted to sell only to specified customers; one company may not ship his products outside the States of "Washington, Oregon, Idaho, and Montana, and the Territory of Alaska." Where a single concern has an exclusive license to manufacture a single type or for a specified use, output demands no formal control. Where two or more produce the same product, there must be an orderly sharing of the market. To such an accord a system of quotas is directed, which may be fixed either at a specific number of units or at a given fraction of the total output. But, no matter how devious the specifications, they hold no confusion and no source of discord. Each fief has its exact place in the pattern of the industry.

⁴Note the respect accorded the amenities among gentlemen—*ibid.*, p. 407:

"MR. SMITH. * * * If some particular situation arose where you might say, almost as a matter of courtesy, if he wanted to make just a small quantity of that particular line of ware for a particular concern, we say, 'All right, go ahead,' and we added that right to his license."

⁵It is said that in drawing a complaint against the Hartford Empire Co., attorneys in the Department of Justice made repeated attempts to throw all the restrictions into a graphic table which the eye could easily take in. They were estopped by the number and variety of the criteria employed and had to fall back upon a recitation instance by instance.

The net result is a business despotism. The free play of the market has been replaced by the controls exerted from the directors' board. Hartford Empire is the creation of the dominant companies and represents their interest. The smaller concerns exist by its sufferance; and for them it establishes the conditions of business life. Its license—granted, revised, revoked at the pleasure of the corporation—is the right of its possessor to his trade. Its control runs out, through its affiliates, to comprehend all with whom they do business. In many instances it decrees that all who use a certain type of glass container must purchase from a single firm. In others it fixes the terms of ultimate sale and leaves to the processor of the product no option but to take or to refuse the bargain. The network of conditions attaching to license constitutes a scheme of arrangements under which the various firms carry on. If it is a "self-government for industry," it is an industry in which consumers, who must pay the bills, have little voice, and in which the various members share in proportion to their financial strength.

In Hartford-Empire the lines of a corporate estate appear in bold relief. As phial, fruit jar, beer bottle, the ware is the most ordinary device. Its raw materials are omnipresent; it demands little manual skill from labor; its technical process is easily mastered. Yet it has become a dominion unto itself, hedged off from invasion on all sides. An order, a government, a system of law has been constructed for the whole industry upon the grant of letters-patent from the Federal Government. In a series of moves, the corporation has made itself sovereign; usurped the operation of the market; made dependent provinces of each concern it has taken in. It appoints to each its product, decrees its price, limits its output. Its powers of police comprehend many feudal estates; it levies toll upon every industry which must make use of its product. Its dominion extends to every aspect of the trade and its system of police is far more effective than that of any arm of the Government. Its authority—which rests upon a grant from the United States—is far broader than the Supreme Court has been willing to accord to a sovereign State of the Union.⁶

It is easy enough to recite a case for Hartford Empire. It has come into being in response to a demand for order within the industry and security to its firms. In glass containers, conditions do not invite a well-behaved competition; to allow the trade to remain open to all who wish to enter it is to invite chaos. Firms would rush in, capacity to produce would quickly outrun the capacity to absorb. A concern, met with a falling demand for its product, would seek to produce other wares. The advantages of specialization and quantity production, with their attending efficiencies, would presently be lost. As production fell back into a multiple process, costs would rise and higher bills would eventually be thrust upon the public. There would be a constant threat to solvency; the periodic epidemics of bankruptcy would fall upon all alike. In the end the plight of the glass container would become like that of textiles, dresses, or soft coal. All lines would fade from the trim design of the industry. All who have a stake in its operation would have to pay for an emergent disorder.

⁶ *New State Ice Co. v. Liebmann*, 285 U. S. 262 (1932). If the activities of Hartford Empire are legal, a grant of patent has an amplitude of authority in excess of the police power enjoyed by the several States.

The scheme is a barrier against industrial confusion. The creation of a structure accommodated to the task to be done is affected with a public interest. As the modern system came into being, Statutes of the Realm repeatedly sought the well-ordering of particular trades. If somewhat later the whole matter was left to the market, it was because competition was regarded as competent to impose design and purpose. In glass containers it is no longer able to do so, and all that Hartford-Fairmont, Corning, Owens and others have done is to provide a substitute for its magic. For such an undertaking they need an official warrant, and letters patent are the best to be had. They have set up, as their creature, Hartford-Empire, whose office is to have and to hold patents. To it they have assigned their various rights and it has been charged to invent, to contrive, to improve, but at such a pace as to keep alive a few basic patents. If perchance it now and then strays from the promotion of the industrial arts, it is to serve the more important cause of an industry, whose trim lines make it a model within the national economy.

It is idle to blame the architects for their industrial structure. Their concern was the pursuit of gain; they took the way of money-making; and if they made the road broader than legally it ought to have been, a public authority should appoint bounds. It may be that competition which served well enough an industrial system just hitting its stride is no longer appropriate—but the law of the land does not say so. It may be that a political should succeed an economic order in the conduct of trade; but if so, it should not ride roughshod over the little fellow, nor should it impose taxation without representation upon the consumer. If there is to be a government of industry, it should be a responsible one. Its task is to mediate between interests at stake, not to conduct the trade as if it were the property of a party. A sanction has been diverted from its accredited office to serve a private cause. A corporation has usurped the function of the market and has become sovereign of all that touches its product; as an authority, liable only to itself, it lords it over a gigantic domain. In glass containers, *l'état, c'est Hartford Empire*.

THE AUTOMOBILE—AND ALOOFNESS

In a sense the automobile has been patented 175,000 times, yet a relative peace prevails along the technological front. One-fifth of all applications for patents have to do with some part of the mechanism for keeping the motor car going. Nowhere does the net-work of overlapping claims, all nominally legal, more vividly invite stalemate and litigation; nowhere has the system sown in more fertile ground the seeds of its own destruction. Yet for a quarter century a kind of truce, not without overtones of suspicion, has prevailed along the corporate frontiers of the industry. And the arts which converge in production have developed without the great to-do which attends the clash of private claims.

The quiet has been due to an attitude which is at once nonchalant and practical. It is an expression in common-sense of a free enterprise which in less than a generation converted a luxury into a necessity; which, as a latter day miracle, wove the motor-car into the very fabric of American culture and made its use an aspect of everyday-life. The policy dates from a declaration of independence by an

upstart, who had won a modest acclaim as a racer, was intent upon making and vending his own car, and refused to pay tribute to an overlord who claimed the technical province as his own. For a lawyer turned engineer had a patent on the whole automobile, and insisted that legally the right to produce was at his pleasure. The "legitimate" trade consisted of firms which possessed his licenses, whose security was constantly threatened by the fly-by-nights. By the owner of the Selden patent Henry Ford was firmly told that he was a poor risk; that as a person he was unfit for the responsibilities of manufacture; that his flivvers were a disgrace to the dirt roads upon which they ran. The purchaser of one of his not-yet-tin-lizzies was threatened with a suit as a contributory infringer of the patent on the internal combustion engine. In those days—near yet far off—a corporate estate sought to be established; litigation raged along the frontiers of the closed industry; Henry Ford discovered patent rights to be an obstacle to personal initiative.

If he had been good at books, Henry Ford would doubtless have called himself an individualist; nor would he have resented the epithet "rugged." He knew, or thought he knew, his modest destiny; he wanted to exercise his right to practice the trade of his choice; he was not going to be stopped by a stranger who waived letters from the Patent Office. He would not accept the credentials at face value; he felt sure they could not survive judicial scrutiny. For as long ago as 1879, one G. B. Selden, a patent lawyer of Rochester, N. Y., applied for the basic automobile patent. His claims comprehended the whole motor-car—all complete with parts, apparatus, mechanism, gadgets. It was a self-propelled vehicle comprising steering wheel, a liquid hydrocarbon engine of the compression type with the engine running at a speed greater than the driven wheels, a disconnecting means between the two, and a body adapted to either persons or goods. In effect, these were rather broad claims, written in terms of technical categories rather than specific devices. As steam, compressed air, electricity fell by the wayside as sources of power, and the internal combustion engine gained the victory, the enveloping claims covered any motor driven by gasoline. With a patience born of shrewdness, Selden did not urge unseemly haste upon the Office. He was, with an occasional amendment of his petition, content to let it lie for 16 years. And not until 1895 was his patent granted.

From early days the rising industry was troubled with squatters. On November 4, 1899—4 years after the patent was issued—Selden granted an exclusive license to the Electric Vehicle Co. It promptly asserted its rights, and, with a vigor greater than it put into its product, it brought suits for infringement against unauthorized manufacturers, their dealers, and their customers. An action, the outcome of which for a time promised to be decisive, was in 1900 lodged against the Winton Motor Carriage Co. After 3 years of skirmishes, which fell short of any general engagement, the Winton Co. acknowledged the validity of the Selden patent and acquired a license to manufacture thereunder. In a short time 16 other leading manufacturers threw up their defense, recognized the patent, and took out licenses.

They joined with 13 other concerns which had already been licensed to form the Association of Licensed Automobile Manufacturers, which promptly embarked on a campaign to terrorize the in-

dependents by enforcing to the limit the claims of the Selden patent. A levy of $1\frac{1}{4}$ percent of the catalog price was enforced upon the members; the fund thus raised served the double purpose of policing the grant and paying the royalties which were its due. The right to license had come to be vested in the Electric Vehicle Co., whose instrument the association was; its committee was allowed to determine to what new concerns the company's license was to be granted. The right to the trade was now in the hands of those with whom the newcomer must compete. In a word, so far as the licensee could exercise his authority, the industry was closed.

The spirit of enterprise, however, was not yet balked. A united front was to be met by a united front; and, in 1905, 19 concerns which had asked no one's leave to make and market, founded the American Motor Car Manufacturers Association. Although the usual professions of benevolence, mutuality, and good works were put forward, its real purpose—as every member understood—was a concerted defense against the “legitimate” industry. A long series of legal controversies between licensees and trespassers ensued; and on September 19, 1909, the Federal court for the southern district of New York upheld the validity of the Selden patent.⁷ As a result the organization of independents dwindled to its end in the following year. But a very determined member, Henry Ford, refused to accept the decision and appealed. In 1911, in a radical decision almost unprecedented in its industrial effects, the Circuit Court of Appeals held the Selden patent was to be sharply restricted and that Ford was not an infringer.⁸ An industry never tightly locked against the newcomer was thus formally thrown open.

Thus a distrust of patents was engendered; and the circumstances of an industry just off to a dominant place in the economy drove it home. The bumptious persons who had forced their way in were none too respectful of privilege; they had scored a triumph over vested interest; their experience was easily distilled into an attitude toward the whole system. They wanted to drive ahead hard and patent litigation moved at a pace far too slow for their purposes. Their scanty capital did not permit manufacture in the ordinary sense; they had to limit their operations to putting parts together; and the assembly line is not a vantage point from which to contemplate the virtues of an inaccessible technology. Patents came into play, not so much in Detroit, South Bend, Flint, as in places where the components of the automobile were made, and there they were seen as a hazard to production. The price of the motor-car had to be brought down, its market enlarged, its use brought to lower and lower income groups, to the good end that volume be kept up, unit cost be kept down, and the stream of outward bound cars be kept moving. A scrupulous observance of patent protection was a ceremonial for which the industry could find scant time.⁹

⁷ *Electric Vehicle Co. v. Duerr*, 172 F. 923 (1909).

⁸ *Columbia Motor Car Co. v. Duerr*, 184 F. 893 (1911). It is a little surprising to find the conflict terminating so abruptly. Suit might have been filed in another jurisdiction, and if another circuit court could have been persuaded to sustain the patent, an appeal might have been taken to the Supreme Court. The contrast with the Bell patents is startling; one judgment closed an industry, the other opened an industry. Yet it is difficult to discover criteria in terms of which the decisions went different ways. A resort to practical standards is more useful; the telephone, far more obviously than the automobile, invites a unified operation.

⁹ For a graphic account of the conditions under which the industry got its start, and which early got written into its habits and structure, see Mark Adams, “The Automobile—A Luxury Becomes a Necessity,” in Walton Hamilton and others, *Price and Price Policies* (1938), pp. 27–81.

Out of experience, policy is born; and a chapter of history lives today in the usages of the Ford Motor Co. The concern applies for patents on its inventions; it must do so, or else it would leave its technical frontiers exposed to raid or even to invasion. But it treats its industrial arts as if they were common knowledge and makes no use of them as counters in the competitive game. Licenses are freely granted to all responsible parties¹⁰ who can turn the techniques to practical account and no royalties are demanded. Its letters patent are held in reserve as a defense against attack: they are never employed in aggressive warfare. Since parts are purchased and assembled, a large number of suppliers are bound to Ford by contract. The manufacturers of parts are encouraged to develop new methods and to improve their products. But in his agreements with them, royalties are not to be accounted an expense of production. No inventor, or his assignee, is permitted to sit back and claim a return for effort which has become sterile. Ford clings to the maxim that every man must be up and doing; and he yields no place to a person whose concern has come to be the exploitation of his product rather than the improvement of his process. Even today the structure of the industry accords little with the kind of blue-prints which investment bankers draw; ¹¹ its trim lines are not overly blurred by a superimposed structure of privilege.

Ford has allowed 92 of his patents to be used by others. In turn he has made use of 515 patents which were not his own. Although the ritual of the license has been duly fulfilled, no money has passed for value received and the frontier has been freely open to the passage of useful knowledge. The company has not escaped litigation; from 1926 to 1938 some 350 threats of suit for infringement have come in; and of these some 60 have materialized as actions in court. But, in spite of its disregard of the prevailing mores, Ford has not done badly. For the period it has lost only one suit in a court of last resort. The flood of threats is a vivid illustration of the dangers which attend business enterprise in a domain where the industrial arts are susceptible to rapid advance. The policy seems to have served the company—and the public—well. There is no evidence that the progress of technology has not been as rapid as in kindred fields where grants have been fully exploited.

The policy of Ford has spread to the industry. A trade association, composed of most of the remainder of the industry, was formed—for cooperation, to keep the industry open, and against private property in the industrial arts.¹² From the first it was agreed that patents were to go into a pool upon which all might freely draw and that no royalties were to be paid. To this end a cross-licensing agreement was executed by almost all the members. Ford, who had fought the court fight alone, held formally aloof, although in practice he went along. Packard which held patents which it did not wish to share

¹⁰ One wonders if Ford is setting up a standard of financial respectability which initially he himself was unable to meet. In an unsuccessful attempt to liquidate the case of *U. S. v. Hartford Empire* (No. 4426 D. C. N. D. Ohio), by consent decree, it is sad that the defendant offered freely to license all "responsible" parties and that Thurman Arnold, Assistant Attorney General in charge of the Antitrust Division, having in mind Ford and the Selden patent, refused.

¹¹ In the notorious case of the reorganization of Dodge Bros., the industry has had experience of investment control. In a competitive market the reorganized company could not support the inflated capital structure and Chrysler had to take over.

¹² After some eight changes in name, it is now known as the Automobile Manufacturers' Association.

became a fellow-traveler, cooperated with the Association, was given access to the inventions in the pool, and was charged for the privilege.

The first agreement was made in 1915 and terminated in January 1925. The signatory firms delegated to the association the power to grant licenses and shop rights under all letters patent save such as were expressly excepted. The technical domain was wide; it covered inventions useful in the manufacture of motor vehicles, their parts, and accessories. There was no provision for royalties. The general idea was that, since many contributed and all were free to use, each took out more than he put in. The articles of covenant comprehended not only current patents but all to be acquired during the 10-year period. As the years passed, the concerns—the few survivors among the many which had made the start—won strategic positions. In response the usages of the pool underwent change. The march toward responsibility is reflected in four succeeding agreements.

The first extension was for a 5-year term. It went into effect on January 1, 1925, and included patents owned or controlled by the members signatory as of that date. But custom from without mildly obtruded as a proviso that patents acquired during its life were not to be comprehended within the agreement; they were, however, included after the 5 years had elapsed. Thus the industry accommodated legal usage to its requirement—the 17 years specified by statute were cut to half a decade. A second renewal, executed in 1930, prolonged the term of the pool to 1935. While it included grants outstanding at its initial date, it made no provision for others which might come into being during its life. A third renewal, echoing even more faintly the spirit of the early adventurers, followed to continue the arrangement to the beginning of 1940. It includes no patents acquired since 1930, exempts grants controlled by a signatory not itself engaged in assembling parts into the finished motor car, and does little more than make available to all its members inventions which have already been put to common use. In addition design patents are excepted as well as inventions capable of being put to use in trucks, tractors, ambulances, and fire-engines. A fourth renewal, in itself a mere makeshift, extends the arrangement and maintains the pool as of January 1, 1930. Its intent is to afford a fresh review of the whole subject, to discover if possible terms upon which a larger number of patents can be brought under a mutual control.

In successive movements the theme is developed *diminuendo*. In bald figures, the pool included 547 patents in 1915; 1,066 in 1925; 1,687 in 1930. Of the total, 1,058 were still alive at the beginning of 1935. As the years pass the members tend to contribute, not pioneer inventions, but improvements. A plausible argument is put forward for withholding novelties: large expenses have been incurred in research laboratories and testing grounds; a skilled personnel has been assembled to advance the industrial art; unless the company is allowed to recoup, such investments will dry up. The dominant impulse is doubtless zeal in the competitive game. The days of the conversion of lower income groups to the use of the automobile are over; current sales are a replacement of old cars. A company must at all costs hold its old customers: there is little room for growth except at the expense of the other fellow.¹³ Accordingly a manufacturer is

¹³ Sales, of course, differ from year to year. But the variation follows the course of the national income. The result is not that people use cars in fat years and give them up in lean ones. Instead they hasten, or defer, the time when the old car is turned in on a new one.

loath to surrender an invention which will enable a rival to duplicate his own offering. He is likely to keep for himself a patent so long as it has currency as a talking point. Nor does the Christian zest for holding all technical knowledge in common easily survive the resolution of the industry into the Big Three—Ford, Chrysler; General Motors—and the independents. As between unequals, the quid pro quo of all business activity becomes elusive. As of the 1st of January 1930, General Motors had contributed 518 of the 1,687 patents in the pool. The executives of the hustling industry would probably regard 17 years as a reflection of a tempo truly medieval; but they have come to appreciate the value of technological protection during the period they can turn a really significant invention to account.

The problem is further complicated by the structure of the industry. Since in its formative decade it got started that way, the "manufacturer" assembles a miscellany of parts which come from various points. Accordingly the art of fashioning a motor-car is a composite of technologies which are practiced in the most diverse of shops. The overlord at Detroit or Pontiac or Racine sits at the hub of a process of fabrication which stretches out web-like. His connections may be enduring; yet they are established upon contract and his sources of supply are independent corporations. Thus useful knowledge comes into play, largely within the provinces of the imperium, removed from the direct control of the overlord. Here is a fault-line in the topography of the automobile which it is hard for a patent pool to bridge.

It is easy to visualize—as an abstraction—an ideal system for the industry. An accord, which establishes free access to all technology, is decreed by the lords of the assembly line. Then each manufacturer writes into its contract with every corporation which is a source of supply a clause binding it to transfer to the association the power to license its patents on parts. But equities are far too tangled and stubborn for so idyllic a solution. A patent runs for a minimum of 17 years; the contracts between assembler and parts maker are not always durable; a surrender of the patent privilege is rather more than even a superior bargaining position can dictate. The parts makers are in deadly competition for the favor of the manufacturers; it is rather too much to expect one to swear away his competitive advantage, especially if he has put money and trouble into the invention. The manufacturer and a parts-maker may each have patents upon different features of the same mechanism and, where the line is nebulous, each may feel that the other is invading his preserves. Even if the necessity of getting together may prevent litigation, suspicion will not down. In such a situation equivalence in the exchange of equities is hard to effect. If a manufacturer extends to other manufacturers rights to a patented process, and if they employ it vicariously through their own corporate sources of supply, the parts-manufacturer may obtain cross-licenses without giving anything in return. In the arrangement reciprocity might be lost, and one manufacturer—who had held his own inventions back—might be in position to bring a suit for infringement against another whose patents he was freely using. A general pool among parts-makers would provide an escape from such problems. But they are far too numerous, too different in

size, too varied in technical task to play even formally and with reservations at the game of cross-license.

Against such difficulties rapid headway is not to be made. General Motors has taken over the assets and the business of Delco. If it should be compelled to put the Delco patents in the pool, they would become available to other motor-car manufacturers and their subsidiaries. Thus they would become available to Delco's competitors—such as Electric Autolite—without licenses in return. Since the patents are employed in the manufacture of other products than automobiles, a patent arrangement for the industry ramifies far beyond its confines. Against such severities a mitigating factor is "a great deal of cross-licensing" by motor-car manufacturers outside the scope of the agreement. The throw-back in this is that such bargains are made on the basis of mutual self-interest, and are therefore likely to stop short of letting a serious competitor in on a novel invention. The leading executives, however, recognize that current usage has strayed far from primitive practices. The trend sits oddly upon an industry whose patent pool a decade ago was cited by the Secretary of Commerce as the outstanding achievement of any trade association. The reconsideration of the problem, now going forward, may spell the death of the agreement or its rebirth in another form.

An insistent question is why not a return to the early way of Henry Ford. If his experience has been happy, why should not other producers, one by one or in concert, imitate his example? Can the policy be carried over, or does its success rest upon factors peculiar to his own organization? It may be that the headlong ingenuity of the Ford engineers defies patent restraints. Or the sheer size of the company and the iron will which directs its resources may endow it with powers to drive straight ahead. And the awe which it has inspired gives it a great bargaining advantage and causes partsmakers, general opinion, and even public officials to defer.¹⁴ In its heyday, in an open competitive struggle, it all but monopolized the low-price field. Its way was that of the pace-setter; and habits of thought developed during the period of its dominance live on.¹⁵ Its patent policy is a single expression of its spirit of non-conformity. Ford's individualism has made him regard technical novelties as common knowledge. For if he takes what he wants and licenses freely, if he does not exact and refuses to pay tribute, if he brings no suits for infringement and fights with all his resources those brought against him, what of legal right and lawful sanction is left? To take out patents only as defensive barriers against attack is to pay lip service to a system to which one accords no devotion; to refuse to pay royalties is openly to commit a breach of the patent proprieties.

If then it pays Ford to be heterodox, why is it not to the advantage of others? In one of the most patent-inviting of industries, a dominant manufacturer allows his rivals free access to his inventions—and yet remains one of the Big Three. There are, to be sure, other advantages—a huge accumulation of capital, an organization geared

¹⁴ Note that the attitude on patents is but a single manifestation of a pioneer individualism. Ford has been antiunion and has had repeated battles with the National Labor Relations Board. He was violently opposed to the National Recovery Administration; is set against "paternalism"; and has not hesitated to challenge statutes of various kinds which are expressions of the public control of business.

¹⁵ A psychologist may wonder if a thought-pattern developed by Henry Ford as an automobile racer lived on when he became a manufacturer of motor-cars.

to high momentum, a name that has become another word for efficiency the world over. But, with many other giant concerns, restriction forges the armament behind which technology struts its creative role. Invention is promoted, patents are bought up, business enterprise is fortified by a monopoly in the productive process. Others insist that progress in the useful arts is impossible without the exclusive right that the law confers; that experimental work would never be undertaken if its results were available to all. The life history of the Ford Co. is no abstract argument; it is a practical demonstration to the contrary.¹⁶

A part, at least, of the Ford policy has been carried over to the industry. It is hard to think of a form of cooperation between competitors which has brought as much benefit to the public as the cross-licensing agreement in respect to the automobile. To the extent effective, it has assured to every buyer the incorporation of the latest improvements in his motor-car, whatever his choice; it has guaranteed to him the latest and the best of motor transport. He has been freed from judgment upon intricate points in competing technologies, very imperfectly manifest to the naked eye; it has enabled him to make his choice, where he has a greater competence, by a comparison of aesthetic qualities and facilities for comfort. He is free to choose the car with gadgets and style to his taste without putting in jeopardy his demand for a reliable instrument of transportation. The price he pays does not have to carry a heavy burden of expense for litigation; royalties do not exceed \$2 per motor car. The members of the trade are freed from the trouble and expense of struggling with patent problems. Their whole energies can go into improving their product, perfecting the process of manufacture, devising methods of marketing. Since 1915 there has not been a single lawsuit between, or involving as adverse parties, the concerns in the trade. Many small companies have enjoyed free licenses to hundreds of inventions, in instances without a single patent given in return. A heterodox chapter challenges the whole theology of the patent system.

¹⁶ One would have been told in advance that if all members were allowed access to a common technology, competition would have been a dull game for lack of anything to play up. Yet in automobiles it has been intense and has covered a wide zone. In human affairs it is not always possible to tell clearly which is cart and which is horse. It may be that the lack of novelty in technology caused rival concerns to discover "talking points" elsewhere, or the discovery of talking-points in respect to style, gadgets, and trade-in, make patents less of a card in salesmanship. The point is that a common sharing of advances in the technical arts does not cramp the advertiser's style or spoil the market adventure. The product is sold to the ultimate consumer; it must make its appeal within a zone of tolerance fixed by the psychology of the buyer. In landing a prospect, advertising and trade-in allowance are of more account than the devices of technology. In such a market industrial supremacy does not rest upon patents.

CHAPTER VIII

THE CREATION AND VALIDATION OF SANCTIONS

NORMS AND PROCEDURES

A dichotomy, which represents no one's conscious intent, marks the nature of the patent. At law, as statute and Constitution attest, it is a letter which certifies invention and rewards the inventor. In fact, as the stories just recited indicate, it has become an asset to business, a fence about the corporate estate, a weapon of competitive strategy for private industrial government. Its character has been transformed as it has come into a strategic office in the national economy. In view of the currency which it has and the employment thrust upon it, it is pertinent to ask how the "letter" comes into being, what sort of struggles center about it, how and by whom it is validated.

The patent involves the creation of a privilege, a definition of a domain from which others are to be excluded. But if others are to be kept away, it must be made certain that they have no rights within the given area. So, in the fixing of boundaries, a trio of claims which may conflict must be passed in review. A "letter" must not issue if some other was the first or true inventor; the lines must be sharply drawn so as not to encroach upon adjacent patents; no part of the public domain of technology can be comprehended within the writ. And—lest it be forgotten—the grant is to technical progress as a means to an end.

In a more primitive society, every great advance may be hailed by royal writ or legislative act. In an industrial culture, where claims to discoveries come thick and fast, some process must be set up whereby to recognize and certify the genuine novelty. The matter requires norms for invention, a personnel learned in the technical arts, a procedure leading to decision. The very purpose of the grant suggests the norms. The invention must extend the frontier of useful knowledge; no equity can be conferred in respect to devices and process in vogue; innovation cannot lie in a merely mechanical application of old principles; it must, however meager the contribution, exhibit some spark of creation. To guard against private parties laying claim to devices or processes already in use, an act of Congress limits the grant to a "new and useful art, machine, manufacture, or composition of matter, or any novel and useful improvements thereof." In the administration of a matter so intricate, this simple formula has been resolved into a set of "principles," which themselves have become a structure for the creation of an elaborate web of distinctions and judgments.

An administrative process is essential to the application of so simple a formula in so tangled a world. An agency called the Patent Office has been set up to pass upon the validity of claims. But in

order that rights, even in the making, may be carefully guarded, a series of appeals runs up, to the United States Supreme Court itself. In the realm of patents, even less than almost anywhere else, "general principles do not decide concrete cases." At best they furnish values, point directions, supply convenient pegs on which to hang decisions. A host of factors play upon their evasive terms; a multitude of considerations collide within their protective framework. So long as the times change and the minds of men differ, no inflexible rule can govern the granting of a patent. The examiner, the board of appeals, the Court of Customs and Patent Appeals, are unlike in attitude and outlook, in grasp of technology, in disposition to be lax or severe. It is rather to be expected that lower Federal courts should differ from each other and should not always see eye to eye with the Patent Office, and that the Supreme Court should bring to the matter an Olympian understanding to which no lower tribunal can rise.

As an issue goes forward, expense accumulates and doors are harder to crash. Such is the way of litigation, and the patent appeal finds the way upward unusually hard. It is the rare application for a patent which gets to a court; and a hearing by the Supreme Court is little more than a statistical possibility. A number of conditions conspire to hold discretion within the Patent Office. The task of appraising claims has been entrusted to it by Congress; as with other agencies of administration, only a strong presumption that the action taken exceeds the broad bounds of official discretion warrants review. A business risk attends the appeal; a heavy expense is incurred in a technological gamble; an indulgence in litigation is a luxury which few going concerns can afford. For the run of earthly affairs, legal process is a secondary resort; in the ordinary instance the decision of the Office as to whether the letter shall issue is final. Once the invention is certified, the chances are that the issue will not be reopened. The patentee goes his way, exploits his grant, and levies his toll—until his right collides with another patent or some stubborn individual persists in using the knack as if it were common property. Bother and expense suggest compromise, and procrastination suggests no challenge to the administrative judgment.

The Patent Office, therefore, is the custodian of the general interest; and, save in the exceptional instance, the public must look to it for protection. Upon the norm of patentability—as it interprets and applies it—rests access to useful knowledge and sanctions with which to restrict freedom of enterprise. In the Patent Office negligence, ignorance of technology, muddled judgment may, in its effect, choke the channels of industry. Let it relax its diligence at any point or for a moment, and a segment of the common fund of knowledge is blocked off for at least 17 years. For, once the writ issues, the patent cannot be canceled except upon a showing of fraud.¹ The patent law in action is made explicit in the thousands of existing grants. As it confuses its facts or mistakes its norms, it puts into circulation letters for which there is no constitutional sanction. It issues, as it were, a false coin of privilege, with no ready process at hand to retire the counterfeits.

Yet its process of decision has not been geared to the magnitude of its task. The grant of patents on the level of detail invites a flood of

¹ The equivalent of cancellation may emerge from some other legal process. A suit for infringement, e. g., fails because the "invention" is held to be devoid of novelty.

applications. The grist aggregates between sixty and ninety-five thousand cases a year; the serial numbers of patents granted now run to 2,000,000. A functional consideration of all applications is out of the question. The Patent Office can take no account of motives; whatever the applicant's purpose, his papers are routed through the accustomed channels. It is conditioned, by tradition and training, not to look beyond the point at which the letter issues. Yet, with its range of inquiry severely limited, it must keep up with its work. For the deluge will never abate; and a hurried survey, in terms of mechanical likeness to what has gone before, is the most that can be given. Upon such a plane not even the closest supervision could cause the staccato beat of acceptance or rejection to fall into a fixed technical rhythm.

Even upon such a level it is no mean task to maintain vigilance. The Patent Office was set up before the nature of its responsibility had been disclosed; its structure has not, by legislative act, been recast to accord with its place in the national economy. It must skillfully dispatch a huge volume of business; its decisions give direction to the whole course of industrial development. The character of its high command should reflect its function; a large professional staff should have maturity, competence, wide experience, not only with all the provinces of applied knowledge but with the wider range of scientific inquiry which lies behind. It should be able to entrust only the detail of its work to persons of routine or clerical competence. In the sum of its decisions, it promotes or retards the industrial arts and decrees the technology of tomorrow. It should serve the Nation in the way a research organization serves a business venture.

The Congress, of course, has made no such provision for the Patent Office. Its funds have been scanty, its personnel poorly paid, its staff insufficient for the work. It has had to resort to makeshifts to carry on; and as its task has grown in size and scope, these makeshifts have grown into an institution. Its salaries have not been adequate to hold skilled scientists within the Government. Before the depression an examiner's period of service was about 5 years—just long enough to pick up some training, win a law degree from night school, and make a connection with a private firm. His stay was often only a step in his career; his desire to get ahead, a consequent temptation not unduly to exalt the common good. In recent years the turn-over has been smaller, the tenure longer, the caliber of the staff higher. The group of examiners has annually to pass upon a minimum of 60,000 applications, a load which runs to 12 per person per week. Even the best of men must falter under such a burden; the usual item involves an extended research into an intricate body of technology, yet only a few hours can be given to it.

It is idle to expect perfection, or even a high standard of performance, under such an arrangement. The examiner can note the claim, glance at the specifications, conduct a casual inquiry, draw on his experience for anything in point, and allow or reject the application. If he certifies a true invention, the patent issues, without appeal, review, or further ado. If he finds some of the claims valid, the petitioner may have his patent by canceling those rejected; or he can appeal the rejection without jeopardy to any of the rights allowed. Unless the examiner is new at his task, there is little supervision of his work by his superiors.

The procedure is far too circumscribed to take account of all the interests concerned. The public is a party; yet, save in the person of the examiner, it is without representation. As custom has it, the claim to a patent starts with a presumption set in its favor. The applicant is entitled to his grant unless the examiner can clearly show that he is not. If the letter issues, it is assumed to be valid unless the adverse party to a suit can show beyond a reasonable doubt its lack of merit. An individual wishes to reduce to private ownership an aspect of the common arts. Yet at law the presumption is set in his favor and there is no adequate opportunity for rebuttal. It is impossible to think of another situation in which a part of the public domain is sworn away so easily.

Nor do other parties in interest have adequate opportunity to answer. Those who hold adjacent grants are concerned in the outcome, yet formal notice is not accorded them. The application is kept secret; neither application nor letter is made public until the patentee chooses to disclose his invention. If claims are discovered to encroach upon or to conflict with grants outstanding, the conflict is resolved by cancellation or disallowance. If information about the pending application gets out, other parties who are of interest may object. Action on such protests is at the discretion of the examiner. The resulting inquiry does not fall into the form of a legal process; the protestant is not an adverse party; he is quite without rights which he may assert. Since the whole procedure is forbidding, there is no wonder at the small trickle of protests.

If the examiner finds any of the claims invalid—as an aspect of common knowledge, within the domain of an outstanding grant, wanting in invention—he disallows and gives his reasons. The applicant then has 6 months to amend and to fortify his papers for another examination. Until recently the cycle of rejection, revision, reexamination could run its round almost indefinitely. Now the examiners are attempting to make an ultimate disposition of every application no later than the third examination. Yet the overworked staff is some months behind on its docket, and judgment is an extremely procrastinating affair. The issue, too, is not to be simply posed; technology is intricate; an invention stands in a number of lines of development. The subject can be approached from many angles; the claims can be written up in many forms of language. Accordingly, the writing and the rewriting of the application is itself an art; and an ingenuity, which makes claims far broader than they appear to be, is rarely unable to put the case in another way. The contest is a most uneven one; the public interest is represented by an examiner who can rarely give more than half a day to the matter; the private interest by skilled attorneys, whose time and resources are limited only by the ability of their client to pay fees.

A final rejection by the examiner is no ultimate. If the applicant has the will, the time, and the money, he can appeal. His plea is heard by a group of 3 chosen from a panel of 9 who make up the Board of Appeals. In form the appeal is an action against the examiner; the record goes up, accompanied by a learned argument that the judgment below should be reversed. The hearing occurs usually about 1 year after the final rejection. The process is saved from a break-down by the small number of appeals—about 1,800 out of an annual grist of 60,000. In more than two-thirds of these the

examiner is affirmed and in only a fraction of the others are the applicant's claims fully sustained.

The process is strictly a one-way affair. It is the private party who is accorded a second hearing; the public interest is entitled to no petition for review. Thus the examiner whose disposition is to allow claims will seldom be called before the Board of Appeals and will have a high record for making the correct decision. The examiner who is prone to reject borderline claims runs the risk of a low batting average. By office tradition, a record of reversal in more than one-third of the cases raises a presumption against the examiner's competence. Thus in the scales of justice the private right weighs far more heavily than the public interest. The organization is geared to whittle away at the common fund of useful knowledge.

Even an adverse decision by the Board of Appeals does not exhaust the applicant's moves. In the Court of Customs and Patent Appeals he may lodge an action against the Commissioner of Patents. Judgment is rendered not as in open court after full hearing but on the basis of the record built up below. The procedure consumes another 12 to 24 months; not more than 80 to 120 cases a year go this route; and in perhaps four-fifths of them the examiner is affirmed. The number of appeals is limited, not so much by legal obstacle as by the prevalent opinion that the procedure is waste motion. In the appeal the court stands by the severities. It limits its consideration to allegations of error; it refuses to go behind or outside the record; it admits no new evidence. It has by patent lawyers been referred to as a rubber stamp.

As a result frustrated genius has resort to an alternative procedure provided by statute. It brings suit against the Commissioner in the District Court for the District of Columbia. There, after the manner of a court of first instance, a full dress trial may be put on, all matters at issue may be fully explored, and the line between old and new evidence is obliterated. The district judges, whose experience with technology is casual, are regarded as more lenient than their brethren upon the Court of Customs and Patent Appeals. For the last year their record is 58 affirmations, 22 reversals, and 16 judgments affirming in part and rejecting in part.

At this point appears a curious quirk in the law. So long as the matter moves in the regular channels only the private party can appeal. But once it is taken to an outside tribunal it falls under ordinary legal usage, and from the decision of the district court either side may appeal. As a matter of practice, however, the Patent Office exercises its privilege only when a question of law is raised and not when the judgment does no more than reverse the decision of the examiner. Thus, in judging the validity of the private claim, the interest in the preservation of the public domain is nowhere formally presented; and, at the only place where there is a move for a remedy against improvidence in making grants—a stage reached only in the exceptional instance—the guardian of the people's rights is silent. From the Federal district court only 26 cases went to the Court of Appeals for the District of Columbia last year. From its decision either party may, if it can secure certiorari, take the issue to the Supreme Court. But such an appeal is among the faintest of human hopes.

Such is the usual procedure when the issue is patentability. The fireworks are really touched off when two applications concerning an identical invention reach the Patent Office at the same time. Then claims collide, and the question of priority becomes insistent. If the examiner is of opinion that two applicants are claiming the same invention, he will declare an interference even though the claims are differently worded. He even suggests to each party the language employed in the claims of the other in order that the issue of priority may be sharply joined. If both persist in standing by their guns, each is required to attest under oath the date at which his invention was conceived and reduced to practice. The statement of each applicant is then submitted to the inspection of the other. About 1,000 cases of interference are set up each year—roughly less than 2 percent of the total number of applications. Of these fully two-thirds are disposed of by concession, cross-license, or estoppel—where the oath of one party establishes priority for the other. Less than one-third survive this process of comparison or bargaining—at which the public interest has hardly a look-in—to be decided on evidence. In such instances, however, interference proceedings are bitterly contested; and honesty frequently becomes a dominant issue, since often inventions come into being too gradually to be dated, and proof of the approximate time is in the possession of a party who has an interest in distorting the information. As issues of testimony become dominant, the question of patentability recedes.

As with other decisions of the examiner, an appeal lies. But, unlike the case in which the applicant has been refused his grant, it goes up as an adversary proceeding. Hence the Patent Office is neutral; the question is which of the two combatants is to be accorded a privilege. In respect to interference, a wider choice in legal process is available. A party not satisfied with the result may go direct from the review in the Patent Office to a Federal court. Here he is not limited to the District of Columbia; his suit may instead be brought in any district in which he can establish residence of the other party. If inventors gird for legal combat, its course is likely to be protracted. The average is 2 years if the parties accept the examiner's decision, 3 years if they go to the Board of Appeals, and 4½ years if it is carried into court.

Such figures, however, are abstractions and fail to reveal the detail of bother and circumstance which attends the ordeal. A recent case, exceptional to be sure, is none the less brimful of the possibilities which may be touched off. An application for a grant was filed with the Patent Office in 1921. After a long and eventful history marked by disallowance, amendment and disallowance, the claims were eventually rejected. The decision of the examiner was upheld by the Board of Appeals. In 1928 suit was filed in the district court, and in 1931 the decision of the Commissioner was reversed. As the action was brought the application became public, whereupon two other parties whose claims had been under consideration since 1920 and 1922, respectively, asked that an interference be declared. Thereupon—after the decision in the district court—the Patent Office acceded to the request. In the course of a hearing which lasted for more than 4 years, a record of 4,700 pages was accumulated. In the end the examiner awarded priority to the claim filed in 1921; he was affirmed by the board of review of the Patent Office.

An action was thereupon brought in a district court by a losing party. It was heard by a judge who had never previously tried a patent case. The trial lasted 7 weeks, the record ran to 2,300 pages, the examiner's determination was upset. Recourse was had to the Circuit Court of Appeals, whose judgment has not yet been handed down. The parties have already revealed their intention to seek certiorari from the Supreme Court. The statutory life of a patent is 17 years—and 19 years have elapsed since the filing of the application of 1921. And all of this has to do with the mere granting of the letter; in a suit for infringement, all the issues are likely later to be reopened.

Of late, efforts have been made to speed up the work of the Patent Office. The number of applications pending has, within the last few years, been reduced from 180,355 to 116,041; the number which have lingered around for 5 years or more has been cut in half. Examiners have been urged to attack their dockets with dispatch and not to allow the would-be patentee to dally along with amendment after amendment. A special status has been decreed when the applicant makes oath that he will begin "to make and vend" as soon as his patent is granted. In 457 of such cases, 247 patents have recently been issued which have resulted in investments aggregating almost \$9,000,000. The putting to work of some 167 of these new inventions has extended employment to 14,413 persons. Against the dimensions of the national economy such sums have little magnitude, but they are symbols of earnest intent. They evidence a quickening of tempo rather than a revision of current usage. The procedure which attends the patent grant still awaits streamlining; the currency of privilege which emerges still demands a more exacting scrutiny.

THE COURT AS UNDERWRITER

The grant, easily or arduously obtained, does not attest the validity of the patent. It is little more than a certificate which gives to its holder the right to go into court and sue for infringement. The Government does not underwrite its own letters; if the patentee himself is sued, his "letters" accord no certain title of property in the area which they fence off. Competing claims are to be settled by resort to law, and in the legal combat the courts must determine for themselves, case by case, at what value the paper currency from the Patent Office shall circulate.

The task of the court is to stake out and validate a private claim. Yet the creation of individual rights within the domain of technology would not seem a promising venture. An elementary thing like a landed estate in fee simple is not without its legal bothers; if such an equity is complicated by lease, easement, contingent remainder, life estate, future interest, covenant that runs with the land, it can set for the judiciary very bewildering problems. When crafts stood sharply apart, the occasional invention had its distinct identity. In the early days of the machine, when a patent encompassed the whole of a technical process, the thing to be protected was rather sharply finite. Even then there were border-line cases; but private claims invited clean-cut legal recognition.

Against the technology of today no such sharpness of line is possible. A single technical process cuts across a dozen industries; a dozen

processes must be strung together to turn out a single good. A patent is granted, not for the process but for the novel variation; not for the machine but for its improvement. An idea comes out of the air; in spite of its germinal character, it cannot be patented. A scientist tames it into a principle of chemistry or biology; it is still too much at large to invite legal protection. A technician reduces it to a contraction, or imprisons it within design or blue-print; it is now an invention and a patent can be applied for. The industrial art, enriched by the creative work of pioneers, is public domain; a personal claim may be recognized in an application which is derivative. The result of the scientific work is free to all; the bit of tinkering at the end of the experimental journey may create property for the tinkerer. The legal task is clearly to isolate the private claims which are legitimate from the fund of common knowledge in which they are set. Where they collide, it is to prefer one to another or to drive a boundary between them. If each method of production were separate and distinct, the task would be perplexing. But with a score of industrial arts converging upon the same technical area, it presents to the law one of its most baffling problems.

The appeal to law is usually by way of a private action. A patentee, aggrieved or aggressive, brings suit for infringement and between the two parties the issue is drawn. A number of others may be drawn in, as cases for contributory infringement are launched against the licensees of the defendant. But there may be other outstanding grants, close enough to anticipate or broad enough to include that which is the spearhead of the legal attack. And parties may withhold from the current fray patents which are issues within it. A question always present is the encroachment of the private grant upon the public domain; yet it lies dormant unless it is to the advantage of one of the litigants to raise. It is not customary for the Government upon its own motion to move for a cancelation of a grant or for a limitation of the area which it covers.² It may take a number of cases, each with its narrow legal question, to dispose of the technical issue. The matter instead of being presented as an entity is fed to the courts piecemeal.

²Historically and at the present time statutes neither grant nor deny to the Government the right to institute patent annulment suits. Only the long tradition of judicial interpretation as modified by the American courts governs the situation. In the older cases the power of the English Crown to revoke its franchises, its letters patent, on substantive grounds through application of a writ of scire facias and quo warranto was carried over to this country by the bill in equity (*Moory v. Whitney*, 14 Wall. 434 (1871); *U. S. v. American Bell Telephone Co.*, 128 U. S. 315 (1888); *U. S. v. American Bell Telephone Co.*, 159 U. S. 548 (1895)). Although the *Bell cases* employ the language of fraud, the plain indication is that the Government, bearing out the analogy to suits by the Crown, may have a course of action on patentability or prior use. The 1888 *Bell case*, reversing the lower court's opinion (32 Fed. 591 (1887)), held a statute unnecessary in permitting the Government to sue. In the third *Bell case* (*U. S. v. American Bell Telephone Co.*, 167 U. S. 224 (1897)), the Government sought to attack the Berliner patents upon the ground of fraud in the Patent Office and failure of invention. The Court refused to permit the substantive attack by the Government, asserting that the invention was the patentee's "absolute property"; and that although he is bound by all the provisions of the law, in respect to incidents of ownership in which he is not bound he has an absolute right to the benefits of his exploitation of the patent. The Government may not impose its will other than by legislative command and the substantive question of a patent's validity is outside the declared scope of the statute. The broad verbalization of this opinion may have had a marked effect upon the Government's attitude. Two subsequent attempts to test the validity of patents on substantive grounds have been held questionable by the courts. In *U. S. v. Standard Oil Co. of Indiana* (33 Fed. (2d) 617 (1929)), the opinion states, "This court is divided representing the right of the Government to attack the validity of the patents in these proceedings. We are satisfied, however, that we may inquire into the prior art to ascertain the scope of the claims of the various patents involved." In *U. S. v. Porcelain Appliance Corp.* (Equity 1640, D. C. of D. of Ohio, 9 Sept. 1926, opinion unreported), the court noticed but did not resolve the question of the Government's right of suit.

The process of law is always sedate; in respect to patents it is most decorous. The plaintiff has the advantage of strategy; he may select from his arsenal the specific grants with which to press his cause; he may also, if his business activities or those of his opponent are far-flung, choose the Federal court in which to lodge his action.³ As judgment is rendered, the decree without further to-do is binding only within the district. Whether his plea has been granted or denied, the plaintiff may enter a fresh suit in another district; and, almost without limit, he may enlarge possibilities by varying the patent upon which he relies and the person against whom he proceeds. The defeated party may, of course, ask for a review by the Circuit Court of Appeals; but its decision binds only within its jurisdiction. And as a rule the Supreme Court limits its certiorari to cases in which two circuit courts have reached opposite conclusions about the same patent.⁴ Thus strategy has multiple opportunity; in addition to on and up, a large number of lateral moves is possible; a definite answer may be indefinitely postponed; an issue can hardly be settled if a party, equipped with ingenuity and financial resources, wishes to keep it alive.

If the process were fitted out with adequate norms, the task of the judiciary would not be easy. Their lack imposes upon the courts an almost impossible task. From the first, private disputes over invention have concerned an amorphous sort of thing called "patentability." They have embraced such issues as novelty, utility, conception, disclosure, prior employment; the propriety or irregularity of the process from which the grant emerged; the host of contractual questions which dance about assignment. In respect to offer and acceptance, the adequacy of consideration, the decorous march of process, the courts can hold with as much certainty in patent litigation as elsewhere. But in respect to novelty, the true inventor, the priority of claims, the modicum of originality essential to invention, or the line between the novelty and the established art, the jurist's art is not at its best.

A task such as this requires excellence in its standards. The set in use is a heritage from days of petty trade, worn thin and blurred from constant employment. A thing can be patented if it is novel, is the author's invention, is not in common use, has not been anticipated, and finds expression in a machine or a technical process. "Patentability" then is an affair of many factors and its terms are rather values to be brought to judgment than criteria by which an answer at large is to be captured and made articulate. No sharp line separates creation insight from mechanical twist. Nor can a boundary be placed at the end of common knowledge and the beginning of innovation. Where two or more have stumbled upon the same invention, or separate novelties are only variations upon the same technical theme, or the innovation is the same old thing plus, nothing compels a certain decision. The novelty may depart grossly or subtly, in substance or in form only, from the process in common use. When there is alike sameness and difference, "anticipation" is not beyond peradven-

³ Venue, of course, is limited by the statute, 28 U. S. C. A. 100, which permits suit wherever the defendant has infringed and has a regular place of business. The point is, that as business enterprise now goes, a number of locales meet the condition.

⁴ But see *Schreiber-Schroth v. Cleveland Trust Co.*, 305 U. S. 47 (1938), where certiorari was granted because concentration of the automobile industry in the sixth circuit made a conflict of decisions unlikely; and *Mackay Radio v. RCA*, 306 U. S. 86 (1938), where certiorari was granted because the two parties were the only members of the industry.

ture; with an art which is forever developing there are no instruments of precision with which to determine the inventor's own.

No more than an approach toward certainty can attend the application of such norms to a modern technology. A score of patents encompass the making of a pair of spectacles; fix, if you can 20 points at which the flash of an inventor's genius could have appeared. Two distinct processes account for the production of glass containers; but upon the themes of "the gob" and "suction" a thousand variations have been composed. The original patents for shoe machinery expired years ago; the industrial art currently stands frozen, the property of a single concern, in an arsenal of patents. The accepted norms are uncertain enough when applied in the grand manner to sharply distinguished techniques. They can have little fixed meaning on the myopic level upon which patent protection currently moves.

In addition, the institution of justice itself presents its difficulties. Its equipment of procedure, standard, rule, comes from a realm far removed from technology. As cases come along, since none will exactly fit, they have been met with a confusion of approaches and concepts. The logic of the law, for all its rigor, is of little help; for logic can do no more than keep straight an argument which is off to a right start. Suits have to be heard seriatim before judges who differ in vision, viewpoint, tolerance. A general fitness for the bench does not of necessity comprehend proficiency in the industrial arts. Specific competence demands induction into a mystery. As suits come along, the fact situations are not of a type, and a number of technologies must be passed in review. The very language in which plea and argument are expressed is unfamiliar; the advocate, intent upon touting up a would-be invention, makes it all the more mysterious by resort to "highfaluting" terms.⁵ One could hardly expect to find all jurists hewing a precise line as they face such imponderables as "isotopic cracking," "fluorescent radiation," or "frequency modulation." And back of each suit lies a distinctive cluster of usages, which is an industry in operation, only chance fragments of which ever get into evidence. The judges have to decipher, from documents never intended to reveal it, the scope of the patent and the employment to which its owner puts it. As they meet the motley parade, the courts can do no more than their best with the facilities at hand. They make whatever they can out of grant, blueprint, testimony, technical rigamarole. They attempt to set in order the course of events, to unravel a knotty problem in imputation, to capture a conflict of interests that lies beyond the frontier of legal learning. As with more haste than seems to him wise, he must yield to a crowded docket and close the case; consistency is to be expected only from the omniscient jurist. And, with many judges on many benches deciding suits, an urge toward eclecticism can hardly be kept dormant.

Nor have the courts found it easy to keep up with the patent. If business enterprise has been abreast of the times in turning the grant to account, judges have been slow to appreciate the novel place which

⁵ For example, the inertia of a fly-wheel is set down as "the property of a weighty mass" (*Altoona Public Theatres v. American Tri-Ergon Corp.*, 294 U. S. 477 (1934)). The ordinary safety-razor blade becomes, "A blade having a non-circular opening substantially centrally disposed to retain the blade in shaving relation to a guard member, said blade having means spaced from said opening to cooperate with a clamping member to retain the latter in shaving relation to the blade independent of the guard member" (*Essex Razor Corp. v. Gillette*, 299 U. S. 94 (1936)). Such examples are elementary; but at least they faintly suggest the possibilities.

it now holds in the national economy. At the beginning their concern was with the industrial arts still in the service of handcraft or only beginning to serve the machine process. As the situation changed, the older conditions lived on, frozen into precedents upon which judges drew for decision. The sole inventor, who finds life precarious in the prevailing industrial climate, still lives on in the law reports and his impulses still operate in an uncomplicated universe which now occupies a faded page in history. The fact of argument—which has made of the patent a thing beyond legislative intent—is likely to be passed over in silence; the corporation seeking to maintain its estate is treated as the man of science demanding his reward. The doctrines of old, divorced from the circumstance which called them into being, are marched toward fresh objectives. The taming of the patent to money-making was well along before the judiciary discovered the new captivity. Suits whose implications made them cases of first impression were disposed of as if they were no more than next items in a recurring series. A new statement of the law had already gathered momentum before the change in direction received judicial notice. As awareness came, standards for correction could not emerge all at once. The decisions of the courts, in a period in which their materials were malleable, became a factor of consequence in imposing rigid lines upon the design of the economy. As trends took their course, it became increasingly difficult to subordinate to the public interest an exclusive right which had passed into the bondage of business enterprise.

All along the way the attitudes of different benches impose a checked pattern upon the law. Some judges are regarded as sympathetic to patent rights; others are looked upon as "patent smashers." In general, tolerance is most evident in the district court, charity declines as appeals move upward. For 1933, a typical year, the Federal Digest shows the following disposition of cases involving the patent grant:

	District courts	Circuit courts
Not infringed.....	28	53
Valid and infringed.....	47	26
Invalid.....	45	60
Total.....	120	139

Its rule of review sharply restricts the number of cases which reach the Supreme Court.⁷ In the decade 1930-39, some 30 suits, in which the question of validity was directly raised, came before that tribunal⁸ and involved 27 separate grants. One was held valid and infringed, 2 were held not infringed, and 24 were held invalid. The dominant reasons for the declaration "null and void" were lack of invention, 15 cases; inadequate disclosure, 3; prior use or anticipation, 2; delayed

⁶ Decisions of the circuit courts are more likely to be reported than those of the district courts. The district courts found patents valid and infringed in 39 percent of the cases, while the circuit courts did so in only 18 percent of the cases.

⁷ Sec. 240 (a) of the Judicial Code, 28 U. S. C. 347 (a). Rule 38 of the revised rules of the Supreme Court, 306 U. S. 716 (1938), gives reasons which may suggest the grant of a writ of certiorari, chief among which is a conflict between the decision below and that of another circuit court, or between the decision below and a former decision of the Supreme Court itself, or the presence among the issues presented by the suit of an important and undecided Federal question.

⁸ A number of other patent cases, raising procedural questions, were also before the Court.

disclaimer, not a "manufacturer," claim inadequate, narrower claim accepted, 1 each.⁹ A striking, but exceptional case involved the common grease gun in automotive lubrication.¹⁰ The petitioner having made an improvement in pin-fitting, was awarded a grant covering the combination of fitting, grease gun, and hose coupler. Out of some 300 cases in the lower courts the patent was held valid and infringed in all except 1. After this impressive record a suit was lost in the third circuit, certiorari was granted, and the patent held void by the Supreme Court.¹¹ The higher the issue goes, the greater the concern lest private equities be established at the expense of the public domain.

It would be difficult enough, with legal process at its best, to mediate the conflict of claims. So attenuated a procedure can hardly accord rigid definition to private rights. The appeal to law invites a sprawling, protracted, hazardous ordeal. The uncertainty of the norms, the technical character of the matter, the clumsiness of justice away from its native habitat accentuate the difficulties of ordinary legal settlement. As they are addressed to scientific matters, legal concepts lack clear contours and legal considerations are too intertwined to reduce a zone of discretion to an inescapable point. Precedents applied to dissimilar technical situations keep up appearances rather than emanate authority. It may be that every question would win its rightful answer if only it could extract a final word from the last appellate tribunal. It may be that by an all-encompassing oversight the Supreme Court could pound a miscellany of holdings into a code of patent law. But it is a rare case that gets so far and our highest bench accords only casual attention to legal aspects of technology. As usage goes, the last word rests with the circuit court; and in respect to "these abstract questions of invention and infringement," it has—by one whose eminence on the bench accords with his competence at the bar—been called "the court of ultimate conjecture and final error."¹²

PROCESS INTO CURRENT USAGE

A procedure creates a scheme of usage in its own likeness. The parties who must employ it sense its quality, experience its restraints, discover its loopholes. In serving their own interests they will attempt to use to advantage every technicality and to capitalize upon every shortcoming. The letters which emanate are cards; to insist that they be not played is to disparage the zeal which attends business enterprise. A number of results stand sharply out.

The most obvious, perhaps, is the low standard of invention. The grant of a patent cannot be pent up within a formula; the elements which are requisite cannot be specified in norms which the mathematician would call precise, the issue of novelty is too qualitative to be caught up into terms of more or less. Of necessity it involves an act

⁹ The primary reason is tabulated where more than one is given. The Supreme Court for the 10-year period found patents valid in less than 4 percent of its cases. It should be added that the run-of-mine is rather carefully screened, and cases reaching our highest tribunal have, as the process of law goes, a relatively high presumption in their favor.

¹⁰ *Bassick Mfg. Co. v. R. M. Hollingshead Co.*, 298 U. S. 415 (1935).

¹¹ "The question, then, is whether, by this method, the patentee by improving one element of an old combination whose construction and operation is otherwise unchanged, may, in effect, repatent the old combination by reclaiming it with the improved element substituted for the old element." The judicial answer is "no." Mr. Justice Roberts, for the court, *ibid.*, p. 25.

¹² Charles Evans, later Mr. Chief Justice, Hughes. The address is to be found in 12 J. Pat. Off. Soc. 292 (1929).

of discretion, and circumstance decrees a wide zone of tolerance for judgment. There is no formal brake upon the flood of applications; attorneys can be found who will serve the independent inventor with the fee contingent upon success;¹³ the corporate estate is always pressing for more and more grants. Any old contraption that bears or can be affected with a taint of novelty gets its chance. The examiner faces petitions in a stream which relentlessly bears down upon him. The case for the grant is before him ready-made, in technical, factual, eloquent terms. The case contra he must work out for himself with only a fragment of time in which to find his issues, do his research, put his findings together. It would be strange if a host of applications were not granted from the sheer want of rebuttal. The arrangements under which he works makes it easier for the examiner to say "Yes" than to say "No." He is as little prone as another man needlessly to get his neck out; as review goes, if he says "No," there may be an appeal, while if he says "Yes," no challenge to his competence ensues. His affirmance is likely to be reversed only in an action for infringement; and when years in the future a court may so decree, his connection with the case will be dim. In such a process it is impossible to hold to rigid technical requirements. To such a petty level has the business descended that a patent has been issued for an indentation on the head of a screw, and the cross-slotted screw has been buried beneath a collection of patents. The term novelty is applied to innovations of so feeble a character that anyone having occasion to use the art would think of them. The most meager trace of cerebration puts a privilege at large. In a democracy without standards all ideas look alike.

Almost as obvious is the disposition to extend the patent beyond its statutory life. In literal terms the inventor enjoys no protection until after his letter issues; but it is quite common to mark an article with the legend "patent applied for"; and the private assertion of ownership, especially if made by a formidable corporation, is not without its psychological value. Again, if action on an application can be deferred, the terminal date for the privilege may be pushed forward. The devices for delay have been refined into an art of procrastination. A petition is filed; after a decent period it is withdrawn and amended; as decision impends, the application is re-revised through as many editions as interest dictates or officials will tolerate. In many instances, vital claims have been held back, to be added later; specifications have been erroneously set down to secure a rejection—without, of course, prejudice to the renewal of the application.

At such a game one party is better than another; and earnestness of effort is not unrelated to financial power. As to average stay statistics are not too revealing, for all items—whether of great or of little consequence—count alike. The more deliberate consideration obviously attends the germinal invention; and, as the technology of deferred judgment has been elaborated, the period of pendency has lengthened. Thus the patent for the first typewriter was issued within 1 month; for the McKay stitcher, within 2 months; the three-wire system for distributing electricity, within 3 months; the sewing machine, within 4 months; the Goodyear welt and the process for vulcanizing

¹³ But it is said that at present the number of applications handled on a contingent basis does not exceed 10 and may be as low as 5 percent of the whole. A number of lawyers run a sort of pool for all comers, finding their practice profitable if they win a certain ratio of their cases. The percentage was once far larger; its falling off is due to the passing of invention from individual into corporate hands.

rubber within 6 months; and the cash register and the sewing machine all complete within 11 months. In contrast, note the prolonged delay in extending official sanction to inventions basic to a number of strategic industries. The steel industry is today threatened with domination by a sheaf of seven Greene patents which have run in the Office for 5, 7, 7, 16, 8, 14, and 5 years, respectively. The automobile industry is dependent for access to the techniques of starting, lighting, and ignition upon the Riker and Heany patents, which it took the Patent Office 16, 8, 8, 9, 9, 10, and 14 years to validate. The Cowles patent, essential to every automobile wheel, was under consideration for 15 years.¹⁴ The three Gabelmann patents, which have made the calculating machine what it is today, were in process of issue for 26, 20, and 22 years. And the Fritts patent, by which a sound track is implanted on film, entered the Office in 1880 and made its triumphal exit in 1916, 36 years later. A century ago a major invention was under official scrutiny for hardly 8 months; now in respect to the significant invention the ritual of inquiry runs for more than that number of years.

But if official birth can be delayed, production may likewise be deferred. A corporation, having secured its rights, has control over its invention. So long as the concern dominates the market, it has no compulsion to put its novelties into use. Upon them patents are applied for; for the filing of the application fixes a date and establishes a presumption. It renders invalid claims by others who cannot establish priority by the most incontrovertible evidence. Production, however, awaits some event which invites the debut of the improvement—the need of a new talking point, a revised ware to tap a fresh market, the expiration of the older grant. A strategy which shrewdly conceives a time schedule for a series of improvements confers a continuous protection.¹⁵ The life of each invention is finite, yet the art is caught up into an enduring bondage. A plus somehow set down turns a 17-year span into a fragment of immortality.

As its life-span may be lengthened, so may the would-be patentee reach back through time to validate his invention. An application is filed on an idea in the clouds; the claim is set down rather in terms of end-result than of technical process. It is kept pending for a period of years in the hope that the applicant—or someone else—may invent something which falls within the form of words. If he is lucky, and that day arrives, a new application is filed—as a “continuation” or a “continuation in part” of the first—in which is set down

¹⁴ Note—pp. 116–117, above—the Selden patent for the automobile—application filed in 1879, patent granted in 1895.

¹⁵ About suppression much is heard but little proved. It will not be denied that there exist many patents which are going unused. But, it is urged, there are legitimate reasons for their nonuse. In 1934 the Bell System reported to the Federal Communications Commission (Ex. 1989, p. 121) that 54 percent of the 9,234 patents which it owned or controlled were not in use, giving these reasons:

Development incomplete.....	608
Practical application depends on other developments.....	257
Awaiting the determination of commercial application.....	660
Superior alternative available.....	2,126
No public necessity.....	1,307

As to the 2,126 patents for which Bell thinks there is a superior alternative, it must be realized that industrial ukase has been substituted for the judgment of the market-place. The 660 which want practical application and the 1,307 for which there is “no public necessity” are in a similar category. The Bell System is judge, prosecutor, and jury; the public, whose convenience is purportedly served, is not even consulted. It is difficult to place confidence in a private decision, not subject to review and made by an interested party. Whether such a practice is suppression or is given a more charitable name does not obscure the fact that techniques and products are denied the opportunity of proving their value in the only forum where success—rather than speculation—determines the result.

some description of the new application. The later invention takes its date from the earlier process; and, even though in fact another may have been first, his foresight assures to the applicant his priority.¹⁶ The practice—for which the statutes seem to give no warrant—is common among large corporations. A grant in perpetuity is not possible, so ingenuity must make as much as it can of the sojourn of the application in the Patent Office.

As its life-span is subject to control, so can the grant be broadened or narrowed. In the application the claims are as important as the specifications which support them. The applicant claims a little more than he can possibly get; the adverse party will through interference attempt to whittle those claims down. A couple of applications may be filed by separate persons who represent the same interest; and out of a sham fight may come a victory that has substance. An interference may be faked to make the application public and to draw into the open all competing claims. Then, to the hazard of outsiders, the original applicant may amend his claims to comprehend all that they possess. The little fellow is usually short on funds; if he is lured into interference, he may have to retire penniless and leave the field to his rival. In a venture so acquisitive the amateur is always at a disadvantage; the cards are held and what to do with them is best understood by those who play regularly.

Nor does revision stop with issue; the identity of the grant is forever subject to change. A statute provides that "reissue" may be used to eliminate a defect occasioned by "inadvertence, accident, or mistake." Upon such a warrant an ingenious practice has been established. An invention is essential to the manufacture of some particular article. A patent to it is declared by a court to be invalid despite the protest of the owner that it is without blemish or flaw. The independent, gloating over his victory and his free access to technology, is suddenly confronted by a new barrier. The patentee has gone to the Patent Office, made oath, and represented that he now finds "inadvertence, accident, or mistake" in the procurement of his grant in the very respects in which the court has discovered invalidity. The patent for the same invention has now—after many years—just been reissued. Thus, with a change in technical language, the campaign is once more renewed; and, since there is no limit to the number of such reissues, the struggle may run on through many battles.¹⁷ The reiterated beat of a single patent may be just as effective as a series of separate patents in persuading an opponent to surrender or to retire from the field.¹⁸

¹⁶ An outstanding example is the practice of General Electric in respect to the Coolidge double tungsten patent. *General Electric Co. v. DeForest Radio Co.*, (17 Fed. (2d) 90; 1927). In that case the patent applied for in 1912, purported to be a "continuation" of prior applications, the earliest of which was filed July 2, 1906. Tungsten was never ductilized until 1908, when a patent therefor was issued in Europe. This seems to have anticipated the Coolidge invention, the application for which was not filed until some 4 years later. Yet the presumption in favor of the foreign patent was overcome by the assertion of General Electric that the Coolidge date of invention due to "the continuum" was 1906. Thus its validity had been sustained by a Federal court in *General Electric Co. v. Independent Lamp & Wire Co.*, 267 Fed. 824. It is of note that the Judge Mori who sustained this early patent struck down the later one.

¹⁷ An application for reissue may be made at any time within the life of the original grant. It must, however, be applied for without unreasonable delay after the necessity therefor is made known to the patent owner. A court has held that if the attempt is to broaden, a delay of 2 years after issue is presumed to establish laches in seeking reissue. But such a presumption may be overcome by a recitation of convincing facts.

¹⁸ In *Hazeltine Corp. v. Abrams*, 79 Fed. 2d 326 (1935), the Circuit Court of Appeals for the Second Circuit found the original grant to be invalid for failure to disclose a patentable invention. A reissue was then obtained upon a recitation—somewhat meager—of "inadvertence, accident, or mistake." The reissued patent has since been sustained by the Circuit Court of Appeals for the Sixth Circuit. *Detroit Corp. v. Hazeltine Corp.*, 48 U. S. P. Q., 86 (1941).

Nor does the patent stay put as it is kept alive. As venue is changed or an appeal is taken, the invention in question may change its character. To that end the device of disclaimer serves adroit use. Before 1837, if it were adjudged that the owner claimed more than was rightfully his, the patent was void. But it seemed unfair for a man to lose all just because in his enthusiasm he had enlarged somewhat the bounds of his discovery; so Congress provided that a prompt renunciation of invalid would protect the valid claims. The usages of the courts in giving effect to legislative intent has not been uniform; some have been inclined to insist upon a disclaimer straight upon the heels of an adverse decision; others to allow the matter to ride until the ultimate judgment is in. In a diversity of attitudes laxity has its opportunity; and the practice now is to permit the patentee to postpone the moment of decision until a judgment for damages or a permanent injunction is appealed; and, if the defendant fails to appeal, to postpone the disclaimer as long as he chooses. In the meantime, a person can use the invention found invalid only upon peril of being sued in another circuit which may, of course, find the claim valid.¹⁹

In its act Congress contrived a very flexible device. In its use or nonuse, in the choice of the occasion for its employment, the disclaimer became an important tactic. Nor were its terms immune to endowment with strategic purpose. As its words were variously written, so variety marked the technical demesne which was sworn away. A common practice came to be the recitation that the patentee waived claims thus-and-thus, except as they might be read so-and-so or except in respect to this-and-that. In filling in the blanks of so generous a formula, the original claim was completely rewritten: and adepts in its use could, in the form of paring claims down, in effect enlarge them. Then with the original grant minus—or is it plus?—the disclaimer, the old issue in a novel form could be filed in another court. And the disclaimer might be interposed between the decision in the district court and the hearing on appeal; and thus, as the amended document clearly showed, the question reviewed above would differ from that answered below.²⁰ Such possibilities, which the resourceful attorney exploits, keeps the issue evasive even as courts come to grips with it. With such weapons, giant concerns may engage in equal combat, but it is difficult for the small company to contrive a defense against such an attack.

A of these—and kindred—practices make the patent grant a speculative card in business enterprise. A money outlay is necessary to put an invention to use, and the investor encounters no sure-fire proposition. He may perhaps be skilled in manufacture and smart in marketing, yet run the risk of failure in using a technical process which in the end may turn out not to be legally his. As the purchaser of real-estate has the title searched, often going as far back as the original grant, so the company seeking to exploit a new technology

¹⁹ In 1911 an amendment to the Judicial Code—sections 128 and 129, 28 U. S. C. 225 and 227—permitted appeal from a refusal of an injunction and made possible a review of the district court's action. In *Ensten v. Simon, Ascher & Co.*, 282 U. S. 445 (1930), the Supreme Court decided that a patentee must either appeal or promptly disclaim the invalid part of the grant. It is hardly necessary to remark that such a decision did not automatically convert itself into uniform practice. Moreover, the decision was set at naught by that in *Triplett v. Lowell and Dunmore*, 297 U. S. 638 (1936).

²⁰ A beautiful example is presented by a case involving the *Celanese Corporation of America*, now pending before the Circuit Court of Appeals for the Second Circuit.

has search made through all the grants of patents. It is no simple quest, for there is no comprehensive classification of the industrial arts; a number of trends converge to the same point; a line of development spreads out fan-shape. Specifications are numerous and intricate; the inquiry faces many diverse trails. Unlike real property, the search can never be complete. It may, if meticulous care be employed, encompass all grants which are of record; but, since applications pending are for the most part kept secret, there is a zone not easily to be entered—always with the chance that it holds something hostile to the patent the applicant wants to put to use. As with the decades technology becomes more intricate, the risk is greatly increased. At present a patent is, save to the established business unit, a gambler's chance.

As a result a business must arm itself to meet the patent hazard. It cannot afford to be caught using a technique to which it has no valid title. A neat bit of tinkering—as well as a great invention—carries its legal perils; and the corporate enterprise can ill afford to give mighty concern to so petty a matter. But a contrivance—however wanting in creation—is a means of raising an embarrassing question and there are always men who love to reap where they have not sown. A usage very like to the strike suit—brought by a person who has bought a share of stock for purposes of litigation only—has come into being. A patent is secured for its nuisance value; the patentee lives by levying a tribute upon an industry. The practice is notorious; how widespread it is only a comprehensive inquiry can reveal.

Far more common is the use of the patent in the competitive struggle. The *ex parte* character of the process yields year after year its vintage of letters. As the matter goes, there is no certain way by which statements can be verified, specifications checked against operation, exaggeration or even fraud exposed. Grants issue which could never survive the fire of rebuttal; even where inventions do not go into production, the letters which accord protection circulate. Thus relative efficiency in a rivalry for markets is compromised by sanctions which the Government has uttered. Since the validity of these, if ever they are called into question, is to be determined by a bout at law—an ordeal in which survival goes to the long purse—the game may be won through cards which later are discovered to be without value. So long as this situation persists, the technical frontier must be guarded. And concerns, large and small, are compelled to look well to their patents.

So long as a minority can play at it, there is no escape from the expense of competitive armament. General Motors professes the faith of free trade in technology. Yet its passive attitude has not given it immunity from the struggle. In the decade 1927-37 its Detroit office reports 660 "interferences" in respect to technical rights. It records its experience with the self-starter as an instance of recurring difficulties. The device, invented by Kettering, it early acquired, perfected, and put to use. Meanwhile a certain Heaney applied for five patents within the same domain. For 15 years he kept matters pending and gradually enlarged his claims to include every aspect of the starting and lighting system. It is, of course, impossible to judge between his invention—which came to be Delco-Remy—and General Motors without an exhaustive technical inquiry. The point is that the patents were granted when only 2 years of their span of legal life should have remained; the clash broke over inventions which long ago

should have been added to the public domain. In the end General Motors paid out \$900,000 and acquired a license. It may well have regarded the sum as the price of abating a nuisance.

The technical frontier, accordingly, becomes the line of struggle. A concern attempts to fence out, and then to fence in, the adversary. Research is conducted and patents secured to block off a competitor's progress. In studying a rival's ware, one concocts improvements which force him to stay without boundaries. If a barrage of these is skillfully laid down, the enemy possesses a vanishing domain. A kindred strategy marks defense: every change, even every possible change, in the method of production is fortified by legal sanctions against trespass. A campaign demands constant vigilance, a complicated technology, an adequate war chest. As a concern grows in power, it tends to concentrate technology in its own hands. The cost of the struggle—in bother, expense, slowness of movement, arrested development—to the business community may be titanic. Yet, so long as patents may be used as weapons of competition, all who are in interest must carry on the conflict.

Business enterprise gets caught up in the struggle. 'Rival firms insist upon their researchers getting out more and more patents; concerns have been known to specify that so many per season shall be sought. A single basic device may have a hundred improvements grafted upon it. A technical process which has no meaning except in its integrity may be broken up into a dozen inventions. And, as creation descends into the sheerly mechanical, it takes mathematics to specify the number of permutations of given elements which are possible. Nor is there any definite procedure for ridding the operation of the economy of patents which are legally dead. A novel twist may give to an old invention a new lease of life; an improvement may freshen a familiar into a novel process. A high birth rate goes along with an almost invisible mortality. All growth and no obsolescence does not make a healthy institution.

In so intricate a situation, the race is to the swift and the battle to the strong. A concern, exploiting its exclusive right to a process, may build up a monopoly in a product. It may add ingenuity to 17 years and make it equal a long immunity from competition. As the sole practitioner of an art, it has an exclusive opportunity to translate experience into invention. A series of patents, neatly articulated and accurately timed, may be made to carry on indefinitely. Eventually the corporation may enjoy such security that its grants from the Government are no longer needed for active service. The patent to Morse for the telegraph expired before the Civil War; yet Western Union—with Postal as its little sister—carries on. That McCormack once had a patent is now a fact in history; yet almost all reapers are now made by the International Harvester Co. In 1880 a patent was issued to Edison for an electric bulb; the shadow has lengthened into the substance of General Electric. The original patents on shoe machinery had run their course before most persons now living were born; the process is still blanketed by official grants—and over it United is an absolute sovereign. The Bell patents gave to the struggling telephone its start; it matters little today to American Telephone & Telegraph—at least in respect to its ordinary service—whether its devices are patented or not; in either event it would enjoy an exclusive right to their use. An invention

may open a new art; the patent upon it may serve for decades to exclude the public. A domain supposed to be opened by the demise of a grant may remain firmly locked. An instrument designed to encourage invention may hold it in shackles.

Thus a scheme of industrial usage has been established upon a grant from the Government. If such a servitude for the patent is not prohibited by law, at least no statute warrants it. The antitrust acts might have been employed to hold the grant to its rightful limit. But for two decades after its passage the courts proceeded as if there were no Sherman Act.²¹ As if the words themselves were isolated from the world of affairs, the early, fumbling holdings—in which the later issues did not appear even upon the side lines—were treated as leading cases. The situation created by antitrust stimulus and acquisitive response was slow to win recognition upon the field of combat. When a number of ideas of old were equally within reach, the courts could fit their dialectic to their findings; where doctrines from afar lost momentum, an appeal to the order of nature, supplemented by an exercise in logic, was made to supply the deficit. Where legal ideologies came into conflict, the issue was resolved by logomachy, by inclusion and exclusion, by the art of rationalization. The "exclusive right" of the patentee became "the patent monopoly," and this was converted into a one-way street along which no trespassers might go. Reality, the elimination of competitive opportunity, the revision of a passive inventor's right into an aggressive commercial weapon was ignored as irrelevant.

The challenge is the questionable value of the currency by which systems of private government carry on. If all patents went to the courts, were subjected to a like scrutiny, and only those validated went into circulation, current usage might at least rest upon legal sanction. But delay, expense, uncertainty of outcome keep the great mass out of court; a skillful use of well-known techniques can pile up costs and prevent suits. Appeal, the new case, the revision of the instrument, the shift from grant to grant make available resources the only limit to the number of moves. The little fellow thinks at least twice before sending a legal challenge. Even between concerns of substantially equal strength there is reluctance to make a move which may well prove the first battle in a long campaign. Hesitancy is underwritten by gambler's odds which cannot be calculated; for procedures, however irrelevant, may prove disastrous; and the way of the judge in a patent case, like that of serpent upon the rock, is past understanding.

Accordingly parties at odds are disposed to avoid the costs of legal struggle. As they move toward peace, everything favors the party strategically placed, well supplied with funds, equipped with resourceful attorneys. On occasion a little fellow may bring a strike suit and expect to be bought off. Now and then an independent of indomitable

²¹ Only one important case involving the patent as a justification for the usages of restraint came to the courts before 1890. A second case, *Foote v. Park*, 131 U. S. 88 (1889), involved a trade secret, the manufacture of a patent medicine, which had been surrounded by restrictive covenants. The Court held that in respect to the use of process the use of contracts to limit competition did not fall within the common-law prohibition against restraints of trade. The case has some importance because it bobs up in the debates which preceded the passage of the Sherman Act. In 1888, a case decided by a circuit court raised the issue of the nonuse of a patented machine. The patentee had suppressed because of the expense of change and the greater profit to be derived from the older machines. The court held such an act contrary to the spirit of Art. I, sec. 8, subsec. 9 of the Constitution. It stated that patentee is "bound to use the invention himself or to allow others to use it on reasonable and equitable terms." *Hoe v. Knapp*, 27 Fed. 204 (1886). A decision of the Supreme Court 20 years later was to a contrary effect. *Paper Bag Patents*, case, 210 U. S. 405 (1908).

will may persistently refuse to respect a dubious validity which blocks him from his trade. But the urge toward an accord among all who are concerned is strong; and since letters patent are an asset, like stock ownership, an exclusive control, access to investment funds, the general disposition is to cash them in for what they are worth. Thus settlement moves toward merger and monopoly.

It is impossible to estimate the financial damage and the denial of opportunity which attend current arrangements. If he wishes to settle, the little fellow can sometimes convert the cost of a prospective suit into an advantage. But if he wants to fight, or if the larger concern is bent upon making impregnable its monopoly, it is easy to see where the balance lies. A studied legal attack at well chosen points exhausts the resources of the adversary. The action breaks down because the weaker party is no longer able to carry on. Then a private agreement is induced on dictated terms or the bankrupt litigant—who may have been the victor in court—accepts his fate. If the independent refuses to come to terms, he usually falls a victim to a war of attrition. If as an ultimate fact a patent is found valid, the court cannot reach back through time to compensate all who were subjected to heavy loss or put out of business by tentative defeats. Thus settlement moves toward union, merger, monopoly.

Thus the process of validation goes on—with only on occasional resort to the courts. All who have, or insist they have, legal grants are parties to it. If the terms of settlement lack an authoritative judicial reference, they reflect with some accuracy the relative staying powers of those who subscribe. The process of bargaining is much too intimate to allow any consideration of the public interest. But, in an absence of legal challenge, a presumption is set down in favor of the patent thus certified and all that may be done in its name. The superior bargaining position of the patentee is adequate rebuttal. The judgment, despite its irregular origin, is likely to stand as firmly in fact as if it had emerged from judicial process of law. The private government of many an industry rests upon credentials accepted as valid by the trade although they have never been exposed to the ordeal of trial in open court. One can only speculate about the number of grants at large, which supply privilege with sanctions and yet could never survive judicial scrutiny.

All of this impinges heavily upon the common good. In theory, inventors go forth in quest of novelties and, after enjoying an exclusive lease for a limited time, they add their own discoveries to the common store. In fact, rights pass from technicians to corporate estates and, artificially refreshed as needed, are not relinquished until long after their statutory life has expired. The result emerges, almost as of course, from a process of grant and validation to which the public is not a party and in which it is not formally represented. Interest, pressure, technique are skillfully and persistently used to obliterate its rights, and against them it can employ no counter-strategy. The grant of letters-patent has strayed far from its constitutional purpose to serve the corporate estate. Yet, in respect to the great mass of patents, the law has never been invoked. The certificate from the Patent Office passes at face value; or, if it is challenged, validation waits upon the agreement of interested parties. In such cases the currency of privilege circulates upon the presumption that it is legal; and, so long as values are fixed by financial strength, the fact accords

with the presumption. Yet the host of decisions—official and private—are a factor of consequence in shaping the character of the economy. It all leaves the man scrupulous about the sources of authority quite bewildered. He is hard put to it to derive the prevailing system from act of Congress or constitutional intent.



CHAPTER IX

A POLICY FOR THE NATIONAL ECONOMY

IMPROVEMENT AND BETTERMENT

It is a far cry from 1787 to 1941, and the signing of the Constitution and the report of the Temporary National Economic Committee lie worlds apart. Over the decades the usages of American democracy have traveled fast and far. But none have gone farther or moved faster than the cluster of usages which make up the patent system. The ultimate reference, "to promote the progress of science and the useful arts" persists—somewhat obscured by a judicial gloss written over the original text. The relevant statutes have departed little from the original act of Congress; in the variety of provisions which amendment has put into place there is little that would have taxed the eighteenth century understanding. Yet the patent-system-in-action is an affair that was never designed and which only an elaborate explanation could make clear to the gentlemen who on an historic occasion gathered at Philadelphia.

To insist that the patent has strayed from its original office is not to condemn. An institution, even an American institution, is not immune to the law of growth. As circumstance takes its course, adaptation is the price of survival; to speak of its changing identity is only to say that a thing lives. The grant, as the Fathers knew it, is gone beyond recall. Their useful arts and their economy are not our useful arts and our economy; and an instrument whose office it is to mediate between them could not retain its original nature. The quarrel is not that there has been departure—that was inevitable. It is rather that change has been guided by no conscious policy. As private interests harnessed patents to their own service, the Government remained inactive. As a stream of decisions enveloped the sanction in novel usages, a guiding purpose remained off-stage.

If at the moment "the patent question" seems monumental, long years of neglect have made it so. As issues were ignored, they were postponed; as the industrial system took its tumultuous course, they accumulated into a mighty docket. It is now much too late for the occasional stitch in time by court and Congress. The problem demands a series of attacks upon a number of levels. The machinery of issue needs to be modernized. A resort to law needs to become a more certain and efficient instrument of justice. The terms of the grant need to be brought into accord with the conditions out of which inventions currently spring. The rank growth of custom, by which sanctions are held in bondage to vested interests, needs to be trimmed away or subdued to the public interest. And a conscious policy needs to appoint for the patent its proper place in the national economy. Although ways and means present numerous alternatives, the direction is clear.

All that needs to be done cannot be done at once. Knowledge, analysis, intelligent prescription must determine the pace at which a reform, running far behind schedule, can hasten on its way.

The easiest level on which to move is administration. There shortcomings have been most fully explored, the way ahead most definitely charted, opinions drawn most nearly into accord. A host of individuals,¹ the Commissioner of Patents, the Science Advisory Board, the Temporary National Economic Committee have all made recommendations.² A number of these are intended to speed up the process which leads to issue. The public use which may precede the application should be limited to 1 year; the time allowed the applicant to copy claims from an issued patent to assert the priority of his own invention should be reduced from 2 years to 1; the applicant should—unless a committee grants an extension—answer the Patent Office within 30 days, not 6 months. The period between initial filing and the expiration of the patent should in no instance exceed 20 years.³ Lest it occasion undue delay, all cases of interference should be passed upon by three examiners and there should be no review by a board of appeals. All applications for reissue and the renewal of a patent—usually upon the allegation that process or design has been radically changed—should be prohibited. These suggestions, based upon wide experience, are reasonable and have been or should be translated into law.⁴

Yet speed is of no avail unless the Patent Office has facilities for a high level of performance. To that end the first essential is an adequate appropriation. Funds alone do not insure efficiency, but they provide the means with which to secure and retain a high-grade personnel. With a staff which in tradition and competence rises to its task, more exacting criteria may be set, more bother taken to lay all issues bare, more effort given to safeguarding the public domain. If Congress is reluctant to make provision out of its general revenues, other sources might be looked to. No one can deny that patents as a whole have been rather profitable to those who have secured them. If the system has paid its own way, there seems no reason why it should not maintain the expense of its own upkeep. The difficulty in making it self-supporting is in fitting the financial burden to the ability to pay. The heavy expenses are in respect to issue. It was once argued that fees, commensurate with the care which ought to be taken, could hardly be imposed upon application, for the inventor, whose dollars have gone into experiments, comes seeking protection completely broke. As the corporation has replaced the natural person in seeking grants, the objection has lost its force. Yet if application is a poor moment at which to strike, a later occasion is more inviting. If the invention is successful, the patentee can afford to pay a tax which increases over the years or is graduated to the volume of production. If it is not, an inability to meet the impasse might free the channels of trade of patents which are dead. And the mere prospect of the tax ought to rid the docket of a deluge of petty claims. The

¹ A summary of recommendations by various individuals is to be found in ch. VI, of Lyon, Watkins, and Abramson, *Government and Economic Life* (1939).

² A series of suggestions has also been put forward by a special committee of the National Association of Manufacturers. But at this writing the report has not been published and the author has not seen its text.

³ It sometimes happens that all material issues have been resolved after 3 years, yet the elimination of slight inaccuracies under the 6 months' rule may extend it much longer.

⁴ In the closing hours of the 76th Cong., 1st sess., two of these proposals (abolishing renewals and limiting prior public use), and three others similar to them, became law. They are 53 Stat. L. 1212, 1293, 1212, 1213, and 1264.

detail of the scheme of charges would have to be worked out with realistic care.⁵ Yet a prime essential is a separation of the genuine novelty from the spurious; and the system is well able to bear the expense.

At present the use of patents is enmeshed in a network of legal instruments. Inventors assign patents to corporations; corporations lease them out to other corporations; all sorts of terms and conditions attend the lease. Such arrangements may do no more than put an invention to use; they determine the amount and distribute into shares the revenue which it yields; they provide mechanisms through which technology is indentured to money-making. The grant appoints lines to the private claim and, through usage which derives from the resulting contracts, its boundaries may be changed. The legal documents which the letter brings into being are thus of as much concern to the public as they are to the persons who sign them. It follows, almost as of course, that all assignments, leases, and documents correlative thereto, should be public records. Congress should, therefore, require all instruments giving effect to a patent to be filed with the Federal Trade Commission, where they can be consulted by all who are, or come to be, in interest. The very fact of publicity will cause concerns to use greater care to hew to the line and will constitute an effective instrument of police. In addition Congress should instruct the courts, in all legal controversies, to treat as null and void all contracts in respect to patents not so filed.

As yet the line between the patent privilege and the general law is not clearly defined. The patentee insists that his "exclusive" is an absolute right; the Government retorts that all rights are subject to the general law and that letters patent create no immunity to antitrust. A large body of industrial practice is in accord with the claim of the patentee; the trend of judicial decision seems to favor the Government's position.⁶ The matters in dispute may be settled by a further appeal to the courts. Cases involving restrictive covenants, in all their sweep and variety, should be pushed forward as expeditiously as possible by the Department of Justice. The patentee and the licensee are just as much entitled as public officials themselves to know what they can and cannot do under the law. Such cases have a concern that transcends the issue between the parties; they present the occasion for the clarification of public policy. So the Government should be loath to settle out of court—even if in the instance it secures all for which it asks. Before the next step is taken it is imperative to discover what the law currently is.

It may be that the law now accords all that public policy demands. If so, its clear exposition by the courts ought to be enough. If it does not, recourse must be had to Congress for further legislation. A privilege from the Government, in derogation of the public domain, must be held to its orbit. But if Congress is to act, the decisions of the courts must lay bare current defects and reveal what amendments are necessary. Restrictions in respect to capacity, territory, output, price, and ware may or may not at present be legal. The law may now forbid a concern which controls and employs a

⁵ In a number of European countries the patent grant is made a source of government revenue.

⁶ *Ethyl Gasoline Corp. v. U. S.*, 309 U. S. 436 (1940); *Interstate Circuit, Inc. v. U. S.*, 306 U. S. 208 (1939).

certain technology to own a competing technology which proceeds from another base. But, if it does, it is not written beyond any possible misunderstanding in the law reports and only a suit for divestment can clear the matter up. A corporation, which enjoys a monopoly of process and product, may be within its lawful rights in putting away in mothballs radical inventions; but the decisions on the subject are not of recent vintage and may long ago have "exhausted" such "vitality" as they once possessed.⁷ Trade practice is an intricate affair; the frontier between what may be legitimately written into a license and what the general law of trade forbids is irregular and attenuated. A number of points must be fixed to determine its present contours.

The doctrine of restrictive license is a mushroom growth on the law. The legal arguments have been fuzzy, framed by private suits; the court decisions are not fully considered and display no unity. The "law" has been fashioned of unpromising material; the treatise and law journals have tried to make sense of the stuff at hand: Congress has responded only to desperate complaints in special instances; and no one has attempted a fresh appraisal. That task has been shouldered by the Antitrust Division, and out of its score of indictments and complaints should come a body of law more in tune with industrial reality. To test the validity of restrictive clauses in their broad sweep, it has instituted suit in a diversity of situations.⁸ Out of these cases the courts ought to be able to hammer a rationale that brings light into a confused situation. In all such matters due process should become the instrument of legal clarity. No necessary antithesis exists between the grant of patent and the commitment of public policy to free enterprise. If judicial decisions reveal any overlapping domain, the Congress should clear it up.

Well-rooted in the present law is the doctrine that the purchaser of an infringing ware is himself an infringer. Yet it is extravagant to require the consumer, at the moment of purchase, to probe into the realm of patentability and infringement, when only with vexation and delay can the courts themselves get such matters straight. The notion of the purchaser as an accessory to the illegal use of a patent is hard for common sense to entertain. And the mischief which may be done to a manufacturer by capriciously threatening his customers or circularizing his prospects is not easily set aright; his offer to save them harmless is a sad expedient, and the declaratory judgment a puny remedy. The courts are, quite properly, loath to act without a clear-cut mandate, lest they be accused of legislation. Their reluctance calls for statutory correction. The innocent buyer should be immune to suit for infringement; in the tangle of conflicting patent claims, he should be a remote third party. Inducing paralysis in the market place is not an aid to settling a legal dispute.

It is, of course, impossible to accommodate patent law to industrial fact without creating a zone of discretion. A price according to use presents a neat enigma. The competitive ideal has no place for such a

⁷The words are those of Mr. Justice Stone in holding that *Hammer v. Dagenhart*, 247 U. S. 251 (1917), no longer is legal currency. In *U. S. v. Darby Lumber Co.*, 61 Su. Ct. 451 (1941).

⁸Joseph Borkin, *Patents and the New Trust Problem*, appearing in *Law and Contemporary Problems*, Duke University Press Winter 1940 Issue, pp. 74-81. Also see Department of Justice Public Statement, Dec. 11, 1939, the Sherman Act and Its Enforcement.

variation from the rule of single price. The medical profession prides itself upon a single standard of service for all and a graduation of charges to the ability of the patient to pay. A rule of dual or even of multiple price has wide-spread standing, especially, in industries marked by surplus capacity and the dominance of overhead. In an instance such as the vacuum tube, a lower price for amateur than for professional use seems reasonable; and, in general, a departure from the quoted price to allow purchase by members of the lower income groups who otherwise would have to do without would not seem to run counter to public policy.

The trouble is that to allow use to become a criterion of price may present a loophole to privilege. As yet the matter has been little explored. The phenomenon appears in competitive industries; it has long been established in bituminous coal. Yet the notable cases, unfortunately, are to be found in industries like milk and electric energy which savor strongly of monopoly. The economy presents a host of unlike instances, often thinly disguised as different grades or even as different products. But the custom has been subjected to little critical inquiry and the current state of knowledge demands caution in the graduation of price to use. The presumption should run strongly against departure; but some authority should be permitted to make an exception when the public interest beyond any reasonable doubt demands it.

An equally intricate question concerns the pooling of patents. In many instances "the monopoly" is itself a reflection of bad patent law. A number of processes, like and unlike to each other, are employed to manufacture a good. The owner is sure that his own is valid and that all others are infringements. In the ensuing bout at litigation all parties are exhausted and all clamor for a settlement. Straighten out the patent law, devise an easy and expeditious method of validation, and a great many such pools will never come into existence. But if the various patents are distinct and if they must be used together to secure the result—or at least to turn out the best good which advanced technology can afford—the matter is different. The choice is to sacrifice quality and efficiency or to sanction the monopoly. The only desirable out is to accept the pool, place it under public authority, and see to it that private rights are made to serve public ends. A variant of the patent pool is the usage of "cross-license." If, to turn out a superior product, a number of manufacturers, owners of separate patents, grant licenses to each other, the same governmental supervision becomes necessary.

The proposal for a system in which licenses are available to all the members of the trade upon the same terms presents no simple issue. The current state of the patent law gives to "the open license" a prominence out of proportion to its real importance. If the evils at which it is aimed were stopped at their sources, it might become necessary only in the exceptional case. Take from licenses all their covenants of restraint, strip away all agreements in respect to output, territory, and price—and the incentive of the patentee toward exclusive agreements will be greatly reduced. A strong case for the open license is the patent pool. A merging of kindred privileges cannot be left a voluntary matter. At present a concern often produces an invention and secures a patent as the ticket of admission into a pool. The usage is

replete with abuses. Private interests, entrenched behind legal sanctions, cannot be permitted to decide who shall be of their select number.

It is evident that a patent not in use does not promote the development of technology. Its idleness may cause no public loss; a dozen other techniques may lead to the same end. Or its suppression may arrest the progress of an industrial art. In such a case, there should be power to invoke the courts to cancel the instrument—lease, assignment, license, patent—by which the invention is laid upon the shelf. Some cases will call for severe remedies. If the patentee squats upon the public domain in the path of industrial progress, some public body should have power to compel a license.⁹ Such an authority is in strict accord with the theory of free enterprise. It was in vogue in a number of colonies at the time the Constitution was drawn up. By the Fathers, the power to compel license was not regarded as an invasion of the exclusive right of author or inventor.¹⁰ At that time private claims encroached little upon the fund of common knowledge. Now, access to an up-to-date technology is essential to entrance into the majority of industries. If at that time the common good reserved such a power to the Government, its necessity would appear far more obvious now.

It is said, however, that the compulsory license will discourage scientific progress; that the new method, if not put to use, will become available to competitors. Inventions will fall into the hands of manufacturers content to use them for what they are—whereas the up-and-coming concern will hold them back until they are perfected. Thus the requirement will undermine the value of patents whose industrial application has not yet been perfected. It will destroy the bargaining power of the small inventor who is not in a position to exploit his discovery; for, if he does not like the terms offered him, the large manufacturer can extract a compulsory license from the little fellow.

The reasons advanced have cogency in some industries; in others they are at sharp variance with the facts. Administrative discretion in a case by case approach is the proper way to apply a general statute to diverse situations. A statute flexible enough to meet the demands of unlike industries must wait upon a more detailed inquiry. But the demands for national defense call for an immediate answer to specific needs. An item in the catalog of armament must be produced in quantity. All available capacity must be turned to account and quality cannot be sacrificed. Firms which produce for the Government must have full access to the latest and most efficient technical processes. And, since nations now fight each other with economies as well as armies, the necessity extends to commodities not ordinarily thought of as military supplies. It may be that power to compel the necessary licenses can now be spelled out from provisions already upon the statute books. If not, this deficit in national defense needs at once to be repaired by legislation.

It has often been suggested that, when there is recourse to law, the issues should go to a special court. It goes without saying that a single standard of judgment should be applied to all suits for infringement. A national economy, with a common fund of technical knowledge, no longer has a place for multiple jurisdiction. The cases should be consolidated into the docket of a court of distinctive

⁹ The English have such a law. See Patents and Designs Act, 1907, 7 Edw. 7, c. 29, 12 Halsbury's Statutes 593.

¹⁰ For examples of such statutes see pp. 18–23 above.

competence, whose members would sit singly or en banc as the importance of the matter at issue might demand. The judges should be widely versed in the law and industrial usage; they should be served by a staff of skilled economists and technicians. Their procedure should allow matters concerned with the technical arts and public policy an easy access to the record. An appeal from its judgment—allowable only on questions of law, that is, of public policy—should go direct to the Supreme Court. Although there is some sentiment against special tribunals, the consensus of informed opinion favors a single court of patent appeal. Dissent seems to come only from members of the patent bar, and their reasons appear rather obscure.

But reform in procedure cannot await a new tribunal. Multiple suits need to be discouraged and a semblance of unity brought to a wilderness of holdings. To that end a minor reform might work wonders. At present each Federal circuit is in respect to patents a law unto itself. The separate legal domains rest upon the rule of review of the United States Supreme Court. Its custom is to accept the case only if two circuit courts differ in decision. The operation of certiorari is not in strict accord with the intent which underlies the patent grant. Not only do the several courts of appeal vary widely in the criteria they employ but in general their standards of patentability are far less severe than those of the Supreme Court. The result is a great body of patents in effect—how large it is impossible to say—which would probably be declared void by the highest court in the land. Even more important, where patents are shields for restraints of trade, they could hardly withstand the attack of antitrust. The attention of the Supreme Court should be respectfully called to its rule of review which, going back only two decades, presents a curious paradox. Just as technology became dominant in modern industry, and access to it became the condition of free enterprise, the highest court in the land makes the subject of secondary concern. If privilege now at large is to be brought back within its ambit; it can no longer neglect a matter as vital to the general welfare as capital structure or labor relations. No severe or mechanical criteria should be employed to select cases for the ultimate judicial scrutiny.

A growing necessity for which provision should be made is the intervention of the Government in private suits. The great corpus of patent law has emerged from private litigation; it is only in the antitrust cases, a minute fraction of the total, that the Government has been represented. In the ordinary action the parties are concerned only about their own rights; considerations of public interest, unless they happen to serve the cause of one party or the other, pass unargued. Yet every case involves a private privilege in the public domain, and it is essential that its boundaries be sharply defined. The backward state of patent law is not due to conservative judges. Its lag behind other branches is proof of that. It stems primarily from its origin in private litigation.

In its very nature the law of patents is public law. The grant is the creation of a private equity within the public domain. The industrial arts are common property, accessible to all who have occasion to put them to work. The letter from the Government can extend only to the improvement or the novelty. Since it is accorded for a public purpose and limited to a span of years, it can hardly—without confusion of thought—be regarded as a "property." If established

terms must be used, it is rather a lease, terminating at a fixed date and not subject to renewal. Since the machine or process may be widely used, yet a single person is authorized to control its employment, the term "franchise" is even more exact. The privilege accorded for a limited time is exclusive; that is, within the rightful limits of the grant, all other persons are excluded. If the patentee chooses not to "make, use, or vend" the product himself, but is willing to permit others to do so, it is hard to see how his control over their conduct can be broader than the privilege conferred upon him. In all matters of lease, license, assignment, the character of the grant and the purpose it was intended to serve becomes the legal reference.

An instrument needs to be contrived for holding the patent to its orbit. A means toward ending the anomaly would be the establishment within the Department of Justice of a Public Counsel on Patents. It would be his task to exercise a general oversight of patent grants, of the assignment and leases which give them effect, and of all patent litigation in the courts. While an application was pending, he would have the right to intervene if its acceptance carried a threat to public policy. After its grant, he would have the right to institute a suit, to cancel any instrument by which the patent in operation was pushed beyond its legitimate boundaries, made the foundation for a restraint of trade, or converted into an immunity to the general law. Courts are jealous of their right not to answer questions which are not raised. It would be the task of the Patent Counsel to make the public interest an issue in every necessary suit.

TO PROMOTE THE INDUSTRIAL ARTS

A series of such steps, however, falls short of an answer to the patent question. The instrument has been assigned a definite place in the national economy; and, if it has failed in its office or has been deflected from its orbit, a more fundamental revision becomes necessary.

Here the norm of reference is clean-cut and derived from unimpeachable authority. The question is put by the Constitution of the United States itself. The Congress is given no general power to issue letters patent or to reward inventors as it will. An experience with grants of monopoly in England was fresh in the minds of the Fathers; the lesson had been underlined in recent differences with the Crown. Instead the power granted, in the idiom of public policy, was "to promote the progress of science and useful arts." The grant to the author or inventor for "limited times" of an "exclusive right" in his invention was the mere instrument by which the general welfare was to be served. Alone among the powers delegated by the people to the Congress, the Constitution itself provides the reference for legislation and administration. If a statute, or a going system of usage, serves and continues to serve this particular purpose, it is valid. If it forsakes its function, or fails at its task, it has strayed beyond the bounds of its constitutional warrant.

The powers of Congress under the Constitution are stated in broad terms; the instrument is not cluttered up with the detail of application. Congress was free to translate power into a statute—provided the purpose of its act was to promote the progress of science and the useful arts. Its agent for administration was free to apply the

law in instance after instance—provided its ruling served the same good end. The Congress has no power to make a patent serve another purpose; the diversion of a grant from furthering the progress of technology to a dominantly acquisitive or defensive end has no warrant in the supreme law of the land. The public purpose is lasting; its realization has to be altered to changing circumstance. As industrial events have stalked down the decade the problem of patents and free enterprise has demanded fresh statement.

It is, of course, quite out of the question, to state with precision the part the patent grant has played in promoting the industrial arts. There are persons who recite that under the prevailing system technology has taken gigantic strides and who therefore insist upon making the two cause and effect in a simple formula.¹¹ Yet an after-this-therefore-because-of-this-argument is too elementary to explain beyond any reasonable doubt some 15 volcanic decades of national development. Over the years many winds have breathed hot and cold upon the imagination of men and countless factors have speeded or arrested ideas on their way to the status of practical processes or mechanisms. There are in fact more unknowns than there are equations from which to derive their specific values. Moreover, analysis can hardly go forward in terms as broad as the patent grant and the advance of the useful arts. The grant has currency as a cluster of numerous and changing usages, and the advance of technology presents a broken march, in which the several useful arts, impelled by distinct influences, move at different rates. The current issue of office and instrument demands a detailed attack.

A fiction which still has currency goes back to eighteenth-century fact, when an applicant for the Government's favor is thought of as the starry-eyed tinkerer, who draws his specifications on brown paper and selects an attorney from the advertisements in *Popular Mechanics*. At that time the incentive of expected reward could prod the rare individual to invent; the grant of privilege carried little threat to personal opportunity and could hardly abridge free enterprise. Long ago the species began to decline and in recent years it has been headed toward extinction. The Commissioner of Patents has recently testified to the decline of a noble race and has borne witness to their many bitter experiences.¹² That occasionally an outsider crashes through and wins spectacular rewards is not to be denied; but the common experience has been great expectation and bitter disappointment. If the patent grant has been an incentive to such persons, far more often than not its promises have been unfulfilled. That we must take scrupulous care lest the sources of attic invention dry up is at best a minor argument for prevailing reform.

The same concept of the solo inventor animates the argument that the prevailing system is a prop to free enterprise. It has been repeatedly urged that to the little fellow the Government's grant is a shield against the attack of big business. In the nature of things, the contention is incapable of definite proof or disproof. In addition to its promise,

¹¹ Note, for example, the argument of Senator William I. King, in Hearings, Temporary National Economic Committee, Part II, pp. 321-322.

¹² "I do not say that the day of the individual inventor is gone, Mr. Chairman, but I think it is rapidly fading." These are the words of no less authority than Conway P. Coe, Commissioner of Patents before the House Committee on Patents, 74th Cong. (1936). See Hearings on H. R. 4523, p. 1068.

the prevailing arrangement creates serious hazards for the individual who tinkers and contrives. It is a common practice to hurl the infringement suit against the small firm and a grant is a weak shield against the aggressive rival who has the necessary funds and an inclination to litigate to the last ditch. When a small patentee can be forced to come into court and to answer in each of 10 circuits, his survival rests rather upon sufferance than upon his monopoly. It is far safer to accept a tolerance, which permits a modest existence within the interstices of the industry than nobly to go forth to battle to make good his exclusive rights. Those who defend in the name of the poor inventor the abuses of the prevailing system had better devote their enthusiasm to increasing his bargaining power.

The fact is that the conditions of invention have radically changed. The pioneer work is now largely done in laboratories and workshops, maintained by the Government, by universities, by foundations. Here scientists, who are salaried employees, make an advance of the bounds of knowledge their regular occupation.¹³ As they press forward their work in physics, biochemistry, metallurgy, they respond to no immediate stimulus from the patent system or from the urges toward money-making. If "idle curiosity" prompts the quest, it is carried on with the fervent hope that eventually it will make a difference. A great deal of such work is in the nature of discovery, whose practical application more secular hands must contrive. But no hard line separates idea from process, and often the personnel continues its work until the invention is far enough along to patent. It is an all but universal rule that the rights of the inventor are assigned to the organization with which he is affiliated.

In such a habitat the patent has developed its distinctive usage. The code of professional ethics forbids the physician from making his discovery a source of personal gain and in days of old patents were not sought. But second thought has conspired with circumstance to suggest that legal protection can be accepted without yielding to the pursuit of gain. It is argued that the legal sanction secures control by a responsible party, insures the quality of the article, protects its fair name against unscrupulous vendors, and through quantity production makes for a lower price. The University of Toronto maintains its patent upon insulin. At the University of Wisconsin an Alumni Research Foundation accepts promising ideas incurs the expense of development, and grants to individual inventors a share of the royalties.¹⁴ The Research Corporation of New York is a clearing house for the creative contributions of men of science. It accepts inventions; markets them and collects the revenues; disburses receipts between the inventors, the institutions with which they are connected, and a fund maintained in its own name for the stimulation of research. The Carnegie Institution, the Rockefeller Institute for Medical Research, the National Research Council have all approved of patents for scientific work, provided the inventions are dedicated to the public use. Among others Banting, Compton, Einstein, Langmuir, Millikan, Soddy—Nobel prize winners all—have taken out patents. A notion is becoming dominant that trail-blazing ought to be able to pay its own way; and patents are being increasingly em-

¹³ National Resources Planning Board, Reports 1, 2, (1941).

¹⁴ A similar arrangement, varying greatly in its detail, is in operation at Columbia, Harvard, Stanford, Illinois, Michigan, Pennsylvania, California, and other universities.

ployed as a means of finance by universities and foundations. As the endowments of private institutions decline and as social needs arise to claim State tax funds, the patent is likely to become increasingly important as a financial asset.

From so intermediate a form it is but a short step to the research laboratory of a large corporation. An industry often supplies a university with funds for a particular venture, a business enterprise often is driven back to fundamental inquiry. Ideas, blue-prints, personnel move from one to the other far more easily than the words science and business would indicate. The corporate estate offers to the technician opportunity and a living wage. He does not have to beg or starve in order to go ahead, he has access to library, facilities, consultation. He is not immune to the ordinary human urges, but his self-interest is canalized by the conditions of his servitude. He has a job and relative security, a chance to win promotion and to enhance his reputation. He gives up claims to profits and the expectation of a pecuniary prize.

In the corporate estate the promotion of technology becomes a group affair. A collective discipline replaces the freedom of the individual to follow whatever trail he will. Questions come from outside the workshop—the elimination of a defect in the ware, an innovation with which to get a jump on a competitor, an engaging gadget with which to win a new market, the need of a patent to replace one about to expire. The course of business creates its series of tasks—a waste is to be overcome, a substitute material devised, a new article of commerce contrived, the same-old-thing to be fitted out in new clothes. A necessary change creates the necessity for a dozen other changes. An agenda lists more things-to-be-done than can be handled. Research, like management, advertising, industrial relations, is a department of a business enterprise, in which a specialized personnel addresses itself to questions of a going concern. It is no lying-in-hospital, in which imaginative minds are delivered of brilliant creations.

The mark of the corporate armament is on its product. The urge from within becomes recessive, the prompting from without dominant. It is the task of the man on salary, not to invent, but under direction to pursue technical research; it is his concern, not to produce a novelty, but to take a hand in solving a stated problem. The question which must be tackled has many ramifications; many persons, each with his distinctive competence, must lend a hand; the answer is a work of collective authorship. The accent falls upon the necessity of the moment, not upon some "exclusive right" to be obtained. When the creation comes, then is the time to get busy about the patent. The invention emerges, not in its independent right, but as an instrument in the service of business policy. Many innovations would emerge even if they could be accorded no legal protection, for without them, the concern would lose its strategic place in the industry. They are devices by which a firm keeps ahead—or at least abreast—in the competitive struggle.

Corporate, as well as individual, research needs its incentive. Since "a one-man invention" is the exception these days, the patent-system needs to be accommodated to its corporate source of supply. In times past the grant has been in accord with its office in the economy. A term just long enough to allow two sets of apprentices to be trained

was once the established way of bringing a new mystery into the realm. An "exclusive right" for a limited time was then the stimulus which awakened the latent talents of gifted individuals. Advances in the industrial arts now come largely out of the research divisions of business ventures. They emerge, not by a single creative act, but out of a protracted inquisitorial process which roughly falls into the three stages of idea, development, and production. In the current state of culture a good idea is not hard to find, but the gulf which lies between it and production is enormous. It must be bridged by development, an arduous, expensive, unromantic adventure.¹⁵ Here, heavy expense is essential and here the progress of the useful arts is called upon to pay its own way. In some instances research is so essential to the operation of the enterprise that costs may be merged into general expense and covered in total intake. In others technical inquiry cannot be afforded unless it can be made self-sustaining. A single discovery may entail a loss, but the department is a kind of pool, and it needs to subtract from outgo or to add to intake a little more than enough to cover the sums it absorbs. In a word the system needs to be revised to put the laboratory of the corporation upon a profit-making basis. That done, the grant of patent again becomes functional.

It is no small task to accommodate the grant to its corporate and industrial habitat. If the recent inquiry has fallen short of supplying all the knowledge essential to a reform long overdue, it has blazed the trails which need to be followed. The need is now for a general commission of inquiry, staffed by experts, to probe fully into the issues suggested here. An insistent task is a definition of "patentability." All inventions derive from common knowledge; they differ in the quality and magnitude of their contributions to the industrial arts. As respects origin they fall into three rather distinct classes: First, creations which exhibit individual insight; second, derivative processes, worked out by professional staffs, equipped with laboratory facilities; third, variations upon a basic design such as a dozen workmen would independently contrive. The mark of the first is genius; of the second, professional competence; of the third, mechanical ability. It was patience on the part of the man of genius which the Constitution wished to reward; the mere display of capacity to contrive has been repeatedly frowned upon by the United States trails which need to be followed. The need is now for a Congressional Supreme Court. Invention through research financed by a corporation was not in the contemplation of the fathers, yet it is today the dominant source of technology. Norms of patentability need to be sharply defined. The ability that finds expression in improvements is widespread; its application needs no encouragement from the state. On the contrary the grant upon so inferior a level creates sanctions which may be put to uses they were never intended to serve. At best the line between that which is patentable and that which is not is a vague and irregular one, and a severe uniformity is probably never to be attained. But standards need to be elevated and there is little likelihood that they will be fixed too high. To their upward revision inquiry about the state of the industrial arts needs to be driven through industry after industry. The limited tolerance which policy accords to property rights in technology demands the support of definitive criteria.

¹⁵ At the hearings both Knudsen and Kettering, of General Motors, testified to the importance of the period of development. See Temporary National Economic Committee, Hearings, part 2, pp. 328-340, 340-361.

The limited period for which a patent is to run likewise needs reconsideration. The term of years has never been accommodated either to industrial practice or to the incentive it serves. In the England of handicrafts, where patents were given for the development or the importation of a new trade, the grant was purposive. It ran for 14 or for 21 years—it ran just long enough to serve its statutory purpose. Our original period, borrowed from petty industry, was 14 years, with a conditional renewal for another seven. Bothers made extensions unworkable, the difference was split, and the life of all grants was limited to 17 years. The ways of handicraft have fixed the figure for a machine technology. The demand is for the minimum period which, under prevailing industrial conditions, will allow the proper incentive to invention.

The commission of inquiry might well consider two or three separate periods, depending upon the character of the invention. The longest span of life should be accorded to the distinctive novelty—the kind of thing which the biologist would call a sport. To the results of corporate research should—in strict accord with the constitutional purpose which animates the grant of patent—be accorded a life of privilege just long enough to keep such an investment a profitable venture. A new gadget, a result of tinkering, a minor variation serves principally as a “talking point” in a game of salesmanship. If it receives recognition at all, the protection should not run longer than its use decrees, certainly not for more than two or three seasons.

Technology moves now with a speed once undreamed of—its swift march dictates a shortening of the life of a patent. Industries move at very different tempos—unlikeness suggests life spans accommodated to their distinctive requirements. The patent system itself is not designed to give protection at all points where creation touches the industrial arts; if it is to fit neatly, its life span needs to be measured to a variable necessity. A news agency requires protection for its coverage for 4 hours. The life of a design in a dress is a season; its protection for a few weeks is as much as the designer wants. In radio reception technique moves at a brisk pace; in automobiles, innovation now comes far more rarely; in the sewing machine an industrial art is almost stagnant. The period of privilege should be long enough to keep invention on the march and short enough to prevent an interest from becoming vested. Upon the current stage, a span of 17 years—fixed when technology moved at a far slower tempo—may be quite excessive. It may well put in jeopardy the very institution of free enterprise to which it was set down as spur and exception. If its prolonged life allows its owner to dig in securely and to rest upon his rights, it fails the office it was intended to serve.

Practical necessity dictates as simple a scheme as may be. Variable factors must make their peace with ease of administration. At best three classes of invention and three time-spans are as much as the traffic will allow. The would-be patentees will strive valiantly to get their contrivances into the most privileged group and only rigid standards severely applied can stop them. In other domains of public control, industry-by-industry is the only approach which has proved realistic. If each invention is to serve its purpose of promoting the useful arts, the authority in charge must get down to cases. Such a procedure, however, enlarges discretion, complicates issues,

swells the volume of work, and increases the demand for judicial review. A compromise into classes becomes an administrative expediency and the fewer classes there are, the swifter the business will move. Reality must not be sacrificed to routine; but only an extended inquiry can outline a procedure which strikes the best balance that may be between administrative feasibility and technical advance over the whole economy.

All of this is just another way of saying that a patent is a franchise. It is a privilege, in the public domain, granted for a limited time, and intended to realize a public purpose. Like any other franchise, the grant of patent carries its mutuality of obligation. The patentee receives his right, from which all other persons are excluded; in exchange, after a discreet interval, he is to enrich a common fund of useful knowledge with his invention. As conditions have changed, the grant has gone astray; it needs to be restored to its constitutional office in the national economy.

THE PERIL TO FREE ENTERPRISE

An inquiry into "the concentration of economic power" cannot ignore the patent system. Our national economy is committed to free enterprise. Tradition, common-sense, and the antitrust laws concur to impose a competitive pattern upon American industries. Among the oldest and most cherished of our institutions is "freedom of opportunity," an aspect of which is the openness of occupations to all who care to take their chances.¹⁶ The right of a man to his trade is among the oldest of the "liberties" recognized by the common law.¹⁷ A person's liberty in his calling was in time caught up into the Bill of Rights. It has, by the Supreme Court, been declared to be guaranteed by the Constitution itself.¹⁸

But right to a trade is nominal if it is barricaded against entrance by the newcomer. In addition to labor and capital, the business promoter demands access to technology. In the days of handicraft, an apprenticeship enabled the novice to master the art or craft. As the tool receded before the machine, skill fell back before precision, the mystery came to reside in the mechanical instruments, the knowledge which finds expression in the productive process to be multiplied many times over. Ours has become a machine economy, and the advance of all the sciences has been enlisted in the service of the making of wares. It is today hard to think of a trade whose operation does not rest upon an intricate and dynamic technology. Whatever the industry, a legal right to enter is of little avail unless the adventurer has access to the industrial art.

With us free enterprise is the rule, the grant of patent for invention or discovery the exception. The intent is to leave the body of technical knowledge a public domain. But lest the ways of a trade freeze into a ritual, novelty is to be encouraged. The incentive is suited to the public end it is intended to serve; and to draw out the spark of genius within the inventor, he is for a limited time to enjoy the full rewards of his invention. As his grant of letters expires, his

¹⁶ See Walton H. Hamilton, *Common Right, Due Process, and Antitrust*, 7 *Law and Contemporary Problems* 24 (1940), and cases there cited.

¹⁷ See Coke's statement, p. 14 above.

¹⁸ *Algeyer v. Louisiana*, 165 U. S. 578 (1897); *New State Ice Co. v. Liebmann*, 285 U. S. 262 (1932).

novelty is merged into the ancient and refreshed art. In a society in which knowledge accumulates slowly and inventions are technical events, patents stand out sharply as exceptions to the general rule and leave the fund of accumulated knowledge little disturbed. In a highly dynamic society in which productive process is subject to rapid obsolescence and "improvements" are matters of conscious design, such private claims may blanket the whole technology.

If a patent possessed some inherent mechanism which held it to its own beat, all might be well. But it operates only through a medley of human behavior, and in the affairs of mankind it is the rule, rather than the exception, that an institution undergoes repeated changes in identity. It is hard to think of a usage whose current employment follows the lines marked out at its origin. As an instrument passes from any one group to another, its adopted habitat imposes upon it a new role. It should accordingly occasion not even mild surprise that as, by act of assignment, a patent passes from the inventor to the corporation, it undergoes a profound change in character. The dominant concern of the business unit is to make money, not to promote the useful arts. It contributes to their advance, if the pursuit of gain lies that way. But if the purpose of the grant is antithetical—or even irrelevant—there is little place for public purpose in the formulas through which the corporation carries on. Nor are executives to be blamed for making the grant an instrument of solvent finance. They stand in a fiduciary relation to their stock-holders, and unless that becomes their primary obligation, their places are likely presently to be filled by others.

But, if wrong is not to be imputed to individuals, a situation has blundered into being which calls for drastic amendment. A grant of privilege is conferred upon the inventor in order that the industrial arts shall go forward. As a writ from the Government it is a sanction, and in recent decades the sanction has increasingly been employed as a legal immunity. The weight of authority seems clearly to indicate that "the exclusive right" of the inventor is a right—like all rights, subject to the general law—from which all other persons are excluded. The owners of patents attempt instead to make "exclusive" mean absolute and thus to have the State abdicate its authority in respect to all that appertains to the grant. Repeatedly it has been argued that "the patentee is Czar within his domain"; that "he is under no obligation to deal fairly or obey the law."¹⁹ The patent has been made the buttress to privilege. The threat to it has become the enforcement of the antitrust laws. In their concern with trade practices, the Federal Trade Commission and the Department of Justice have been plagued with a legalistic conception of a patent as a sacrosanct area in the economic realm. If defense counsel could associate a grant from the Government with a method of restriction, they created difficulties; if they could involve the charge of restraint in a tangle of issues steaming from a host of patents, they made it almost impossible for any court to probe to the heart of the matter. As letters-patent have been employed as armament against Government attack, patent lawyers have invaded the field of antitrust, and antitrust lawyers have become concerned with patents. Thus the conversion of limited privileges into immunities has become a major legal enterprise.

¹⁹ Brief for appellee, *Interstate Circuit Co. v. U. S.*, 306 U. S. 203 (1939).

Such use of patents as legal armament has become wide-spread. The grant leaves the inventor to enter the service of the corporate estate; the owner-by-adoption leases a number of concerns to make use of it. Into the licensing agreements restrictive clauses of various kinds are written. A number of firms manufacture; yet the sales of each are limited to a certain territory and there is no competition between them. A process can be employed to turn out various articles, or an article can be put to various uses; each of a number of licensees is restricted to a single ware or the sale of a ware for a single use. It is decreed that an amplifier be sold at one price for professional and at another for amateur use; a violation of the license, by allowing a motion-picture manufacturer to purchase at the price specified for the youth who burns up the short waves, is an "infringement."²⁰ Quotas are imposed upon all who produce, and the threat of flooding the market is stopped at the source. Plants of licensees are severally limited in their capacities. A system of prices, prescribed by the patentee, becomes a covenant running with the lease. The Government's grant blocks the entrance; whoever would enter the trade must come to terms with the owner.

Such a type of restriction marks the national economy in many mutations. A patented process frees gasoline of anti-knock; an essential ingredient is tetraethyl lead, "one of the most dangerous poisons known to mankind"; the public health demands that it be kept out of the hands of the unscrupulous, and surely the character of the retailer who cuts prices is not proof against the temptation.²¹ A corporation breaks down the technique of grinding optical lenses into a series of acts; these are to be performed by the manufacturer, the wholesaler and the retailer and each act is covered by a patent; a rigid system of fixed prices moves in lock-step with the technical process. Within a technology as mature as ours, distinct processes may be used to achieve a like result. A concern buys up competing inventions and acquires a monopoly of an industrial art.

Thus, upon the patent, as the instrument of policy to promote invention, an alien purpose has been grafted. As an immunity to antitrust, the grant will be cherished by parties who engage in restraint of trade. Defense moves inevitably into offense. First, a shield that happens to be at hand is used, next a shield is consciously provided for a use at hand—here is the easiest of transitions. A patent provides a sanction but it is about to expire—by some means or other its life must be prolonged. An improvement alone is hardly enough; its importance must be magnified until the line between invention and improvement is completely blurred. A multiplication of improvements is far better; it creates at least an appearance that an industrial art is being transformed. So it becomes the custom to lay down a barrage of patents about the corporate estate. No single grant from the Government, perhaps no combination of grants, may protect restraint against the general law. But, at the very worst, they complicate an antitrust suit, with a technical problem of such intricate magnitude that only the most stubborn court will plow through it. The grant of a patent is intended to protect an invention; in practice it repeatedly operates to block off a whole technology.

²⁰ *General Talking Pictures Corp. v. Western Electric Co.*, 305 U. S. 124 (1938).

²¹ *Ethyl Gasoline Corp. v. U. S.*, 309 U. S. 436 (1940).

In Hartford Empire, United Shoe Machinery, General Electric, a concern becomes sovereign to an industry; its grants from the Government become charters whence emanate systems of private government. Far more often the monopoly wears a much looser cloak. But, rigid or flexible, circumscribed or far-reaching, it everywhere exhibits the same rationale. The rapid march of technology is a threat to the security of the industry; beat upon by invention after invention firms must carry on; the conflict in time brings problems, uncertainty, serious hazards to solvency. In order that he may go ahead with assurance, the executive demands to know exactly how he stands in respect to the industrial arts; the court, in return for a large outlay and after a painful interval, will accord a belated answer. Invention and litigation conspire to lead rival claimants to a settlement. Since its terms are the result of conflicting pressures—and the public is not a party to the accord—it usually takes the form of a division of territory within the technical domain. Each of the contracting parties takes certain processes as his own, acquires the exclusive right to certain wares, or obtains sole control of the market within a defined area. A persistent effort is made to prevent the encroachment of novel discoveries upon established methods. As a barrier against technical invasion various companies exchange patent rights with each other and thus throw a wall about their self-vested interests. It is common practice to make an invention and to secure a patent to block off a competitor's progress. By studying his ware and developing an improvement upon it, a concern may "fence in" its rival; by a series of such moves, it may pin the trade enemy within a technology which rapidly becomes obsolete. As often as not such maneuvers retard, rather than promote, the progress of the useful arts. Invariably their effect is to enlarge and to prolong personal privilege within the public domain.

As a result the authority of the dominant firm moves into the place of the free market. An overlord may decree the conduct of an industry or the effect may be secured through a concert of nominally rival companies. But, whether the arrangement is corporate or contractual, the high command decrees what firms may come into the trade and what concerns must stay out. It fixes a business province for each of the concerns, appoints its market, specifies its product, oversees its prices, restricts its output. Its power of police extends far beyond its own domain; it levies a toll upon every industry which must use its product. It gives its commands to the buyer who must make use of its products. It imposes its will upon the helpless public, taxes the consumer without his consent, lords it irresponsibly over an industrial empire. Its decisions are posed upon other considerations than regard for the general welfare; its judgments, uncorrected by any public body, are not infallible. In an earlier day such an overlord, standing upon his patent, decreed that Henry Ford was not a person of such character that he could be licensed to make cars and that his product was a disgrace to a rising luxury good. Hartford Empire claims for its arsenal of patents an amplitude of power which the Supreme Court has failed to discover within the sovereignty of a Commonwealth like Oklahoma.

All of this leaves its impress upon the pattern of free enterprise. In industry after industry access to the common body of knowledge is not enough. An improvement reduces cost, improves quality, produces a new ware, adds a smart wrinkle—and puts at a competitive disadvantage all who do not have access to it. An industrial art is made the

cr•ature of conscious development; before an innovation becomes common property, another follows and the art is kept blocked off. It is beyond the reach of all who are within, or would enter, the trade, save upon terms dictated by a privileged competitor. An exclusive right to a step in a process thus becomes a monopoly of a whole technology.

The patent accords a limited franchise. So long as it runs, the owner has the market for his ware very largely to himself. But during this period of temporary protection, he has every opportunity to dig in and barricade his trade against the newcomer. He builds up goodwill, induces consumer acceptance, employs advertising, erects a marketing system, comes into control of the channels of distribution. When his patent expires, he remains in command of the strategic heights. He is able to put at a disadvantage any adventurous concern which would dispute the market with him. He may, by means of improvement, give to his grant a new lease of life. But often enough such protection is at best an added precaution. Nominally "the exclusive right" is for a "limited time"; quite often the patentee has it in his own power to repeal "the limited time." Invention has become so much a corporate affair that a Federal judge of long service can recall but one patent case in his court in which it made the slightest difference to the inventor which way the decision went.²²

Thus it has come about that a patent is harnessed to causes it was never meant to serve. It may be used as a shield against public policy, as an immunity to the general law. It may be employed to exempt concerns from the rule of the market and the severities of the rivalry for trade. Competition is a rigorous ordeal; it exacts vigilance as the price of survival. It puts positions, capital, the pay-roll, goodwill in constant jeopardy and is a continuous threat to the security under which the mass of men desire to carry on. In a situation played upon by forces which forever command new adjustments, businessmen will employ their ingenuity to discover and turn to account devices of stabilization. It was the cry for security in a time of collapse which prompted the National Recovery Administration. The trade association represents an attempt to ameliorate the condition of zealous rivalry. The patent has proved to be a help in time of trouble to concerns which, many in number, would be as one in faith and doctrine, one in price policy.

The net result is a strange anomaly within a democracy. An industry is removed from the control of the market and no substitute is provided for its protection which has been forfeited. There emerges an industrial province completely independent of the authority of the Government. The grant is detached from its function of encouraging invention and used to create an immunity to the general law. Its dominant office comes to be its service as a sanction in the maintenance of legal defense. The incentive it releases is not the propensity to tinker and contrive, but the urge to make fast the barriers about the corporate estate; any genuine technical advance it prompts is a by-product of a practice of the acquisitive arts. In such employment a wayward patent system has strayed far from the office to which it was appointed by the Constitution.

The grant of patent is an expression of public policy; so, too, is the commitment to free enterprise. As matters have fallen out, currently

²² Judge William Clark, testifying before the House Committee on Patents, 74th Cong. (1936). See Hearings on H. R. 4623, p. 1075.

they present a clash of values. But, when in practice they collide, the question of preference is beset with no doubt. Although the patent statute is decades older than the antitrust acts, it is set down as an exception to the ancient common law that all trades shall be open to every man who wills to take their chances. The recitation of history, the language of Constitution and statutes, the course of legal industrial events unite to attest free enterprise the rule, the grant of patent the exception. If the economy had remained as the Fathers knew it, the accord would not often have been disturbed. But technology has become highly dynamic, and trades are now in bondage to its latest offerings. If the progress of the industrial arts is to be encouraged, without the sacrifice of our system of free enterprise, the conflict must be resolved.

The general lines of reconciliation are clear; the detail, like that of the adjustment of the grant to the prevailing conditions of invention, awaits specific inquiry. The patent is not an immunity to anti-trust; it confers no privilege to violate the general law. Its intent-at-law is to reward the inventor for his ingenuity or to compensate the promoter for his initiative, trouble, expense. If a fresh slate were at hand whereon to write, the answer would be clear. Let the inventor either manufacture the article himself—at the moment a sheer hypothesis; or let him license others to manufacture. In farming the work out, let him limit his reward to the collection of royalties and play no favorites. In either event his incentive will be preserved and the arteries of trade be kept open. There is no evidence that technical progress rests upon the grant of power to regiment an industry.

But there can be no fresh start. The law, after a long recess, must do the best it can with a business system which grew up in negligence of it. An attempt all at once to bring the practices of industries into harmony with what the law demands would create more shock than the system could absorb without threat of disintegration. And the return would be to a competition, not of normalcy but of volcanic rivalry. Nor should such a move back in the name of the law be unattended by other measures. It is imperative that the economy be kept volatile, forward looking, creative, flexible enough to meet things as they come. But it should wear enough of order to allow to the wide-awake concern a reasonable chance to remain solvent. Here are matters which demand further study and the formulation of a program. But issues, which years ago should have been met, can be no longer deferred. If presently the patent is not brought into accord, free enterprise can survive only on the fringes of a closed economy.

WANTED: A POLICY FOR TECHNOLOGY

The public concern with the economy finds expression in a series of policies. Labor, finance, investment, natural resources have each provoked from State and Nation a succession of legislative acts. As time has passed, conditions changed, knowledge accumulated, values become articulate, measure has followed measure to make and to keep each of these an instrument of the general good. A number of statutes, unlike in character and in specific objective, have defined the place of each in the commonwealth. Land and its wealth has provoked a law of real property, the usages which relate to possession and cultivation, acts of Congress seeking to promote settlement and

to insure conservation. A solicitude about investment ranges from the ancient ban upon usury to the intricate oversight of the Securities and Exchange Act. Finance has prompted a constitutional reference to money, the Federal supervision of banking, the open market operations of the Federal Reserve Board. As notions of its place in the community have evolved, the status of labor has again and again been revised. By clause on parchment, legislative act, judicial gloss, administrative ruling, informal response, a national policy has been set down in respect to the dominant factors in the equation of the general welfare.

The lack of a like attention to technology is hard to understand. In the operation of industry its importance does not fall below land, labor, finance, investment. If the history of the national economy falls into periods, the state of the industrial arts is likely to provide their distinguishing marks. It is technology which decrees the changing molds in which business activity is poured. It is technology which decrees the apparatus and equipment into which investments are cast; which fixes the forms of useful endeavor under which labor is put to work. In a process of growth every factor in the operation of the system of wealth is cause and result to all the others; yet it is technology which stands out most dramatically in the process and it is technology which stamps with the rich color of distinct identity all that it touches. No one would think of a scheme of usage, which seemed good enough a century and a half ago, as at present very useful for labor or land. No one would regard the obvious arrangements, which seemed quite adequate just after the Civil War as at all suited to the current complexities of finance and labor. Yet the useful knowledge of the eighteenth has become the intricate and powerful technology of the twentieth century—and the primitive way of its control has endured.

And the patent question is no mere problem in technology. It came into being as an instrument of policy. Its task was in essence meditation; to draw out what lay dormant in the human mind and to put it to work in the economy. At the beginning it seemed enough to provoke the invention into being and, after a limited servitude, to release it for general use. To stimulate and to release are still objectives of policy; yet each raises a host of issues which would have been strange to all who voted for the original act. To make and to vend are simple infinitives; yet, in our world, manufacture and marketing involve intricate trade practices, and amid their arrangements it is no easy task to keep the balance true between the private equity in a technical process and the common good. If every statute had its appointed orbit, and if in their operation acts of Congress did not clang and clash, all-is-well might ring out along the patent front. But the thou-shalt-nots of antitrust fall jarringly upon the privileges asserted under the Government's grant; and the tariff laws are turned into sheer irrelevance by agreements between gentlemen at home and in foreign lands who hold exclusive rights from their own countries. The corporate estate has learned how to guard itself, its stockholders, its workers against the onrush of a dynamic technology. Yet today the mass of workers have no adequate security against the reduction in the number of jobs which efficiency brings and "technological unemployment" is a dominant source of stress and shock.

Thus, for ordinary time, a crisis and a program of defense touch off another formidable catalog of issues. Easiest stated and soonest

mended is the right of the Government—no matter through what or how many concerns its orders are executed—to access to all that is latest and best in technology. At a time when the resources of the economy must be geared to national defense, it is an invocation to weakness to allow the ceremonial of patent procedure to block the practical application of established arts. One cannot say, "Let a good go into production," and immediately it is done. Capacity, with its complement of machines, has to be created; a corps of workers, with their assortment of skills, has to be gathered and trained; a network of channels has to be cut to sources whence raw materials come. All of these things have to be done in advance of actual need, usually when there is no war to generate in government an emergency power. Such requisites of national security cannot be left to the owner of a grant who allows his invention to be put to work as profits point the way. In all that respects defense, the control of capacity must be liberated from the patent in bondage to private gain.

In peace or at war the international cartel poses its problem. A corporation barricades its monopoly by securing grants in all the dominant nations. If concerns here and abroad lay claim to rival technologies, the conflict is usually resolved by a private understanding. Like countries engaged in power politics, an international accord marks out spheres of influence. The arrangement presents in glaring outline the "basic principle of American law" that the patentee may restrict the geographical scope of the license granted. The limitation, calmly accepted in respect to the domestic market, wears a sterner aspect in relation to foreign commerce. A number of concerns have discovered in domestic law a sanction for participation in combinations which are world wide.²³ An accord divides territories, erects a wall between the home and the foreign markets decrees protection without benefit of the tariff law. In consequence the patent issued by the Government of the United States allows a levy of tribute here by a ban upon imports. The consumer is denied the protection of competition; and an agreement between gentlemen which vaults over frontiers becomes the actual regulation of commerce with foreign nations.

As an instrument of foreign policy the patent has not yet been subdued to control. Germany has been foremost to exploit the frailties of the present system. Its technique has been to break down all quotas upon production at home and to accord scrupulous respect to all limitations upon output abroad. So its own supplies of beryllium, aluminum, magnesium have run in full stream, while the international

²³ General Electric limits its license to make, use, and vend to the domestic market. If a licensee produces for sale abroad, he is to be sued for infringement. In a number of instances, the court has rather clearly said that "the rights not accorded by the license agreement are reserved to the patentee and it is competent" for him "to protect his privileges by preventing others from exercising them." *U. S. v. General Electric Co.*, 272 U. S. 476 (1926). In reality, however, the actual incidents of infringement arise only in the alien nation to which the patented article is consigned. Under these circumstances the restriction imposed upon the domestic grant acts as a protection for a foreign market which the American patent does not control.

If, however, the foreign member of the cartel should import, it is doubtful whether the American member has a legal remedy. In *Bosch v. Graff*, 133 U. S. 697 (1890), an almost directly antithetical fact situation withstood legal scrutiny. The question presented was whether a dealer residing in the United States could purchase in another country articles patented from a person there authorized to sell them, and import them to and sell them in the United States without the license or consent of the owners of the United States patent. The court held that the sale of articles in the United States under a United States patent could not be controlled by foreign laws. In the *Bosch case* neither the patentee nor any assignee had ever received any royalty or given any license to use the patented article in any part of the United States.

cartels have maintained their schemes in countries which accord to the so-called enterpriser the inalienable liberty to create scarcity. Evidence presented to the Temporary National Economic Committee showed how a peace with German industrial power was essential to the existence of an infant beryllium industry. On some military products—optical instruments are a good example—the United States must as royalties pay tribute to patentees of other nations. At the same time American citizens who own foreign patents are paid in blocked currency or not at all. So anomalous is the situation that a bill has been introduced in Congress whose intent is to hold royalties due to aliens from American licenses in a fund from which our own patentees are to collect the sums due them from abroad. Of greater moment, however, are the channels of communication created by the prevailing arrangements, along which "military secrets" take their natural course. The reports, which invariably attend the operation of international understandings, necessarily convey to foreign concerns—and to their governments—accurate pictures of the detail and of the volume of production here. The system of information is no less efficient when the reports and royalties are routed by way of a Swiss bank than if they go to the foreign corporation direct.

Our democracy can no longer ignore such a use of patents as counters in an international chess game. We have not seen fit to erect tariff walls against the importation of beryllium; but private interests, responsible to no elected assembly, have by personal agreement constructed their own. The Government encourages the export trade, but cartels decide that the products of American capital and labor may not go abroad but must stay at home. The treaty-making power is entrusted to the Executive, with a veto in the Senate: commerce with foreign nations is a domain entrusted to Congress by the Constitution. Yet, with patent claims as a base and without official sanction, a network of industrial restraints has been thrown across the seas. In respect to materials of war German-owned patents have blockaded Great Britain from American shores. Foreign patentees collect their tribute before appropriations can be translated into armament. In its sweep across political frontiers the patent system puts national defense in serious jeopardy.

It is easy enough to extend such issues, domestic and foreign, into an imposing catechism. Yet even this exhibit of samples is enough to indicate that the patent question is not limited to technology; that in its magnitude and dimensions it leaves no part or aspect of the national economy untouched. The plain truth is that a complete revision of the patent system is long overdue. A strange paradox attends the prevailing arrangement. The useful arts go forward in a culture which they have created; yet the means for their encouragement, with amendment only in detail, go back to the beginning of the republic. The current institution takes scant account of the prevailing state of scientific knowledge, of the conditions under which discovery and development occur, of the relation of patents to trade practices, of employment by the corporate-estate, of nullification of acts of Congress, of the role of technology in national defense or of its dominant place in the national economy. Nor has the experience of the last six decades—during which the country has been industrialized—come into place in the reconstruction of current usage.

To orient the whole question, and to discover its many facets, a comprehensive investigation is essential. The hearings and researches of the Temporary National Economic Committee have drawn forth a tentative agenda of promising leads. The five clinical reports are down above²⁴ present in concrete instance the kind of inquiries which need to be followed through a score or more of industries. In the past a congressional committee has now and then passed the patent system in review.²⁵ While such work has invariably been valuable, the results have been sharply limited by the instructions. A far more ambitious venture must be undertaken. A concern with the state of the industrial arts and the conditions of their advance is not sufficient. The problem is one of manufacture, employment, marketing, foreign trade, national defense, free enterprise; and wherever the patent throws out its tentacles, there should diagnosis go. Such an inquiry is far too broad and exacting to be handled in such leisure as overworked Members of Congress can spare from their official duties. It demands a Commission, the competence of whose personnel is as broad as its field of study. A scientist and a technician it must possess, but persons whose skills lie in the law, defense, the economy, and administration must be among its members. Its single mandate should be to secure all in the way of knowledge, analysis, understanding which is essential to the formulation of a public policy in respect to technology.

It is, of course, impossible to anticipate the results of such an inquiry. Its very purpose is to secure perspective, concretion, implication which vision now lacks. It should with dispatch, and yet with thoroughness, set norms of patentability, work out a process for an expeditious disposition of applications, fix the ambit within which protection by patent is to operate. It should redesign the patent-system to bring it into accord with modern industry, harness it to the promotion of science and the useful arts, and eliminate its conflicts with the system of free enterprise. It should distinguish clearly between inventions which are creative, technical advances by research organizations, and contrivances which are no more than mechanical variations upon prevailing usage. It should approach invention as creation, consider innovation in relation to the entire technical process and demote "improvement" to a secondary place or relegate it to irrelevancy. It should establish a standard for novelty worthy of the talents of the American invention. It should, in a word, recapture perspective, elevate function above mere variation in detail, and restore the grant of patent to the larger office to which it was appointed by the Constitution.

It must, almost inevitably, propose that the Patent Office be geared to the performance of its office. As an agent of national purpose, it occupies a strategic place within the national economy; its task is to see to it that patents promote—and do not arrest—the progress of technology. It should concern itself with real contributions to the industrial arts; the products of sheer tinkering should be beneath its notice. The Congress has been slow to appreciate the heavy responsibilities which the greatest industrial revolution in history—the end of which lies far ahead—imposes. The agency should be given an or-

²⁴ See chs. vi, vii, pp. 87-122, above.

²⁵ Congressional committees in the past have made substantial contributions to our knowledge of patent practices, but have not achieved the legislative reforms presaged by their investigations. See Revision and Codification of the Patent Statutes, 62d Cong., 2d sess. (Oldfield committee); United States Patent Office, 66th Cong., 1st sess. (Nolan committee); General Revision of the Patent Laws, 72d Cong., 1st sess. (Sirovich committee); Pooling of Patents, 74th Cong., 1st sess.

ganization adequate to the discharge of its duties.²⁶ The Commissioner—or a Board which might replace him—should be experienced alike in science and in public policy and be adequately staffed with lawyers, technicians, and economists of broad training and wide competence. The detail of investigation will have to be delegated to its staff officials; the sheer volume of work demands that the bulk of its decisions be theirs. But by supervision and review the agency must uphold a general policy, maintain fairly uniform standards, and make judgments serve the lawful objective. All patent grants should measure up to its exacting requirements.

In such matters the direction seems clear, though the procedure remains to be devised. A perplexing question is how to give a greater validity to the writs which issue from the Patent Office and yet guard more diligently the public domain. A great reduction in the volume of grants should enhance their value. The staff, emancipated from myopic attention to differences in detail, would be free to give adequate attention to real inventions. All novelties fall into technical domains; each of these is, well equipped with trade journals; an application can easily and promptly be called to the attention of all who are concerned. If any party feels his rights infringed or his trade likely to be restricted, he may, within a reasonable time, file his protest. In any event a thorough investigation by officials whose competence rises above a routine level should precede any grant. If an interested party intervenes, an informal administrative hearing should be held at which all who feel themselves in interest, shall have opportunity to be heard. The letter which issues from such a procedure shall become a franchise for the Government for the use of the invention. In its favor a legal presumption should be written—subject to rebuttal as the preponderance of evidence runs to the contrary.

In the abstract it seems desirable to endow certificates from the Patent Office with finality. As things are now the hazard of infringement is a barrier to entrance into an industry. The innocent use of a process which may later turn out to be another man's property invites bankruptcy. A settling of the question in advance is a primary concern of all the parties. Free enterprise operates best when the unknown factors in the business equation are at a minimum. A protection is afforded the little fellow whose only trump card may be his ownership of a patent. At present, no matter how valid it is, a giant concern may wear him down and take it away.

A shift from judicial toward administrative control is inevitable; but the detail of the process of validation is more important than the auspices under which it is accomplished. There can be no quarrel with a shift of discretion to a speedier and less expensive arena. And a party, perplexed about the limits of his technical rights, is entitled to accept a decision as a definitive answer and not as a move in an endless game. The resort to law must be reduced to a speedy, inexpensive, competent process of judgment. But, under current conditions, there is too little as well as too much in the way of an appeal to the courts. Since every patent is affected with a public interest, a validation by private settlement should be strictly taboo. The Commission should explore this whole domain and contrive a method of validation, simple

²⁶ The Commission might well consider the future of the Court of Customs and Patent Appeals. It seems obvious that the two orbits of jurisdiction have nothing in common. It may develop, upon inquiry that the appeal work now done by the court could be handled through some new agency in the Patent Office itself.

in process, definite in result, fair to all parties who have a stake in the outcome. Until this is done and the recommended procedure proves its worth, an easy access to the courts must be allowed. For, as statistics of decision prove, the higher the bench, the greater the disposition to guard the public domain.

Thus far the questions are at hand, though the provision of answers may tax the resources of the Commission. As the inquiry passes from matters of procedure and technology to those of policy and the economy, its difficulties increase. Here leads are faint, trails unbeaten, and the members must discover for themselves the issues which it is their task to resolve. In such an undertaking there is no escape from a clash of values. The call is to create incentives to the promotion of the industrial arts with the least hazard to the system of free enterprise; to accord recognition to private right in technical discovery, yet forbid personal trespass upon the useful knowledge which is common property. It is to make sure that the urge, strong enough to serve its creative purpose, is not allowed to overreach itself, and that innovations, after their apprenticeship under private auspices, promptly become a part of the public domain. Above all it is to see to it that there is no monopoly of an industrial art and that private claims do not obstruct the stream of technical progress.

All of this, however, does little more than get the agenda under way. The issue and validation of the patent is in a sense a preliminary. It must be put to work in an industry which is a domain of a going economy. As it finds employment it touches off a host of relationships—patentee and licensee, licensee and licensee, licensee and unlicensed competitor, vendor and ultimate consumer—and in the various stages of promotion, manufacture, marketing, such relationship demands a code of fair dealing. So far as such matters have been reduced to law and order, the active agent has been the courts; and the courts, bereft of the authority to legislate, have had to deduce rules of conduct from the nature of the patent and the statutory terms of its grant. No domain of human activity can be properly regulated by standards of legality drawn from afar by an argument alike speculative and attenuated. It demands guiding principles indigenous to its own domain. There has long been a demand for a code governing the use of patents in the economy. A principal task of the Commission is to furnish to Congress the intellectual raw materials for such an enactment. It is almost a shock to discover the tiny fraction of patent practice which has been brought under statutory authority. Vast areas, almost uncharted, need to be domesticated to public policy. It is the function of the Commission's report to outline arrangements which will make an advancing technology an instrument of the general welfare.

An accommodation of the control of invention to the current economy is long overdue. The channels of opportunity are closing; old industries are not expanding; new ones are not getting under way. A rigidity of industrial structure made it impossible for us to take the crisis of 1929 in our national stride; as yet we have not completely recovered from the shock which it brought. The current crisis calls for a program of national defense; it imposes upon the industries of the country a gigantic task; only a strong and flexible economy can rise to the demand. The present inquiry into concentration of economic power has gone far enough to reveal current

patent usage as a dominant factor in imposing lines of regimentation upon the industrial system. It indicates a growing inability to absorb shock or easily and speedily to effect the reorientation which a sizable armament demands. Another investigation is needed to streamline the patent system to the cause of progress which the Constitution would have it serve. The series of immediate steps should be realized at once; others should follow as quickly as understanding can point the way. The general welfare unites with national defense in demanding that free enterprise give to our industrial system the strength to meet the exacting demands we are imposing upon it.

THE RELEASE OF CREATIVE RESOURCES

A final word is necessary to escape myopia, to sharpen perspective, to catch the long time vision. In policy the role of knowledge in the economy is undervalued. It is common among too many of us to hypothecate a world of scarcity in which humanity is the prisoner. Man is Alice in a kind of Blunderland who has to run as hard as he can to remain in the same place. He is a creature of innumerable and insatiable wants; and nature, which must provide the materials that minister to them, is an affair of scanty, even of niggardly, resources. The problem—which can invite nothing better than a passing solution—is to make the stuff at hand go as far as may be. The antithesis between human nature and the material universe is never to be resolved—for there is not enough to go around.

A finite world endows such a statement with a measure of truth; but it is far too much an economic version of the loss of Eden to be a well-rounded account. In an ultimate sense—though it is a little early in the affairs of mankind to raise the question of the absolute—the material universe may be fixed beyond our poor powers to add or subtract. It is, of course, impossible to develop human gifts or to extract worldly goods out of stuff which does not exist. But as yet we have made hardly a start at turning to account what is there; the world of nature is a reservoir upon which we may draw rather than a treasury which we may turn to account.

Knowledge is the key to the universe. As vision is sharpened, knowledge accumulated, taboos broken down, ways of finding out invented, the world about us makes its response. We know nature only as we discover and put to use the things it holds. As scientific inquiry it is held in thrall by the impulses which prompt it. The physicist tells us that at present we know almost nothing about even so elementary a thing as matter. The little we know is in response to the questions we happen to have asked; and these questions come out of a discipline with a life history. If other questions had prompted study, we would now know different things. It is not because the universe has changed over the intervening years that Einstein has raised a problem of relativity to which Newton's telescope and mathematics was mute. What matter is, its ultimate how and why, still eludes us. It is quite possible that, in a fresh approach, even the word may become archaic.

Our "natural resources" are not primary, but derivative. They are natural resources in view of the knowledge and techniques which

currently we bring to them. Where we do not know, and have no means for turning to account, it is as if such things did not exist. As discovery blazes the way and contrivance follows in its trail, our natural resources are enlarged. The Iroquois lived almost at the level of starvation in what is now one of the richest territories in the United States. The American Indians lacked tools of metal with which to help themselves from nature's storehouse; metals were under the forests and there was no axe with which to hew down the trees. Before the coming of Columbus no wheel turned in the New World, resources were resources only near the spots where they were found. In the eighteenth century the spark given off by stroking a cat's back the wrong way presented only the dimmest image of electricity; the composition of coal had been explored only a little ways to reveal "a less agreeable form of fuel than wood." Even a few years ago cottonseed was a nuisance, whose extraction raised the cost of the fiber; chemical elements, later to enter a thousand products, had not yet been discovered. It is the spark of useful knowledge which probes the material universe and sets within the category of wealth the properties of things of which no notice had before been taken.

As a culture advances, and inquiry takes to unbeaten trails, the world of nature is revised. When Julius Caesar conquered Britain, the industrial arts he introduced added materially to the country's resources. The wealth set down by William the Norman in his Domesday Book was severely limited by the methods of farming and husbandry then in vogue. As a varied agriculture, with its rotation of crops, came to succeed the three-field system, the soil of the country was completely remade. It was economic position and the machine-process which gave old England the jump and endowed it with the requisites to a world venture into industrialism. A catalog of resources as drawn up by contemporaries at distinct stages of national development would present very different inventories. The dominant explosive in a clash between cultures—Rome in Gaul, the Caucasian in America, Britain in India, Western Europe in the Orient—is the difference in technologies. The white man has a key to a treasure about which the native knows almost nothing. Whatever natural resources may really be, they are to us as the state of the industrial arts makes them.

The conquest of nature goes forward—by short steps, backtracking, shifts of base, leaps—and always at man's prodding. The simple act of harvest has been elaborated into a science of agriculture; a revolution was essential to its start. Man had to shift his focus from the fruit or grain to the earth whence it sprang if he was to have what he wanted, when he wanted it, and in abundance. He had to fix the calendar, understand the seasons, discover the time of sun and rain, contrive tools and methods of their use. The adaptation of various crops to locale and climate were steps in the domestication of the soil. A discovery of breeding enabled the farmer to make plants more rugged, hurry them to maturity, stiffen them against disease, improve their products, multiply their yields, create new species, and make them bring forth fruits which nature never knew. A long-staple cotton creates a new fiber. A faster growth, or an immunity to rust, extends the area in which wheat can be grown. The invention of dry farming turns a desert into productive land. Fertility is a general thing whose distinctive properties have

only been superficially explored; it is a kind of a hat out of which many products remain to be drawn?

Like the seed, the germ of animal life teems with possibilities. The embryos, out of which come the hog, the sheep, and the steer, present no differences to the eye; it takes the most powerful microscope to reveal the slightest distinction between their microcosms. Yet each nucleus is a peculiar way of taking many elements from the material universe and transmuting them all into a single article which man may use. It may be that in chromosome each is securely locked beyond tempering; yet, under a bisexual system, unit character may be drawn from one parent or the other into a new permutation, and traits which mix can touch off endless novelty. Our beef may be better or worse; it is certainly not that of old England. A process of selection has produced a hog which yields the maximum of pork on the minimum of corn. The Jersey represents a cow highly specialized to the production of milk of a high butter fat. It is the abnormality, or even the mutation which nature never knew, that man finds best adapted to his needs. In a sense, the animals which serve him are synthetic. It is his mediation which builds the bridge across which materials come to satisfy his needs.

The mark of synthesis even more clearly marks man's implements. Nature presents in the raw no tools; the stick has to be pointed, the stone flecked to the hand, the bow strung. Iron, copper, bauxite exist as ores, in various states of concentration and diffusion. But fire, a major invention, must precede the smelting of iron; fusion at a high temperature is necessary to secure a workable copper; and an intricate metallurgical process is essential to the conversion of bauxite into aluminum. In instances the addition of a tiny fragment of one metal to another will turn out a compound with qualities possessed by neither; durilium has a strength and hardness which aluminum does not possess; magnesium combines the stability of steel with the lightness of aluminum. We are discovering that we can make our metals flexible, yet keep them strong and durable. Almost all of them are processed for their roles in industry; if an automobile had to be fashioned out of the materials taken directly out of the earth, it could not run a hundred miles without being shaken to pieces.

Minerals are wealth as they can be gotten at; concentration or diffusion makes them accessible or locks them away against use. As they become more diffused, an improved technology must lengthen our reach or they are lost. Once gold nuggets were picked out by hand. In the days of the rush, the quartz was ground and the heavier grains of gold fell into the sluice boxes. Then came the amalgam process, with mercury as the lodestone, to pick up minute particles and to turn huge piles of waste into gold mines. And now the cyanide process revises an already refined art and again turns dumps into valuable possessions. Scientists allege that a piece of average dirt is 5 percent iron ore and that the earth's crust is 7 percent aluminum. Metallurgy now is concerned with ores of 51 percent or better, and its experimental processes hardly look beyond the 40 percent pure. As late as the last World War we were threatened with a dearth of nitrogen, an essential of fertilizer, yet the air contains 79 percent of that element. Now we have developed a process for getting at it, and the long haul from Chile and the

threat of famine are alike gone. As a fact of nature, underlying parts of Texas, New Mexico, and Wyoming, billions of tons of potassium are held fast in geological strata; but it took decades of chemical research to contrive a practical process of recovery. As an insoluble becomes a soluble ore, we find ourselves abundantly supplied. Minerals serve men inversely to their cost of extraction, and the march of technology overcomes the pecuniary barrier that fences off the supply.²⁶

A single instance tells a series of stories. Marco Polo met petroleum somewhere on his travels. It was to him of little consequence—though a school of opinion held it to be useful in the treatment of mangy camels. When oil was found in Pennsylvania, some shrewd New Englanders discovered—probably somewhere within their inner consciousness—that it was blessed with wonderful medicinal properties, and proceeded to dispense a cure-all at so much per bottle. The kerosene lamp increased the orbit of its use and upon it a great industry was established. With the coming of the automobile, the internal combustion engine converted “coal oil” into a resource basic to national life. It is an essential alike in peace and war; and the culture we know could hardly carry on without it. It has lain down concrete highways, enabled the worker to live in the country, provided a flexible and schedule-less instrument of transportation, and insinuated itself into the fabric of social life.

How much oil we have no one knows. The answer is not a quantity, it is a complicated formula, most of the terms of which are unknown. A motor car can be developed which will deliver 40 miles per gallon where we now get 18. The improvement of the refining process enables twice as many gallons to be obtained from a barrel of crude as a generation ago; that has doubled the amount. The oil that counts is not the oil in the ground but the oil that can be captured; again, with improved methods of extraction, the amount has been multiplied by two and the end is not as yet. Quantity, then, depends upon the state of the industrial arts; and so does the substance vaguely defined as petroleum. Oil to Marco Polo, as the medicine vendors knew it, for the lamps of China, as the motor-car speeds along, that aircraft may move on voyages of swift destruction, are rather different products. Like any other good oil may be defined by the use to which it is put. Already it can be derived from soy beans, sugar cane, bituminous coal; the problem of science is to telescope a process which in geology required millions of years. A distinguished technician never mentions petroleum; he refers always to “oil as we now know it.” Oil is not oil; oil is as prevailing technology and the accumulation of knowledge, makes it.

Yet oil is but an instance; textiles tell a kindred story. In the third quarter of the eighteenth century, Penelope at her loom—a craftswoman who had been at her task from the days of Homer—began to fade from the domestic picture. A series of very crude inventions, by which machines were taught to spin and weave, was obtruded into the process of making cloth. Through their magic very fine fibers were converted into very rough textiles. The new technique, beginning with cotton, was somewhat later extended to

²⁶ For a description of the potentialities of converting the earth's crust into useful raw materials, see C. C. Furness, *The Storehouse of Civilization*, 1939.

wool; but fine cloths were of the hand, and it was decades before a method of quantity production was employed in their fabrication. The historians, who sat on the sidelines, thought so well of the changes that after awhile they gave them the name Industrial Revolution. There are now coming into play novel processes by which even the coarsest of fibres can be turned into the most refined of fabrics. Even the fiber may prove to be a non-essential; silk stockings now stem from bituminous coal and an engineer of repute comments that the cotton picker—if it has really come—comes too late. It might have been a valuable device; but, as technology goes, that was once upon a time. Now it is of little consequence; for in view of inventions which are just around the corner, the difference between fiber and stalk is of no great significance. Yet no one calls a series of discoveries by which all fibers become as one in the sight of technology an industrial revolution.

Such a case may easily become the usual thing. No one as yet knows how many and what useful products may be drawn forth from cornstalks, wheat straw, the heap of weeds, or vegetable waste. A banquet has been served at which an ingredient of every dish went back to cotton; and an exhibition of all the derivatives from it would be a sizable affair. A large number of things that bituminous coal is has been discovered, but its multiple reality is far from being fully explored. A Negro scientist has won acclaim for his race by the tangibles which he has drawn out of the peanut. Iowa State College lists more than a hundred distinct products—ranging from acetic acid to charcoal—which derive from whole corn. It may come about that synthetic foods—which serve the human economy without waste—will become as common as synthetic metals are today. As knowledge grows, the material world is enlarged and restocked.

At this stage in the affairs of mankind, circumstance favors useful knowledge. We are not so absorbed by spiritual values as to be indifferent to material things; taboos of magic or of religion no longer block paths of inquiry; the prevailing climate is not hostile to idle curiosity. Our culture grants to a sizable fraction of the population some opportunity for the free play of intellect. The human mind, of course, cannot create something out of nothing and ideas never enter the most facile heads out of the ethereal blue. The mind can work only with the stuff it has on hand or can pick up; but, as it is stored with notions, images, memories, it can bring familiar things together into new patterns. Thus, an act of creation may attend a process of synthesis. We live, almost all of us, as members of distinct groups; we stand along intellectual frontiers where domains of knowledge meet and various disciplines collide. Those of us who follow intellectual pursuits daily experience a barrage of ideas from many directions. With elements so numerous and varied, a host of novel permutations are always just within reach. At the art of association not a few among the people are deft. Millions of us possess such an ordinary gift, however rare genius or even talent may be. The advance of useful knowledge demands no more than turning favorable conditions to account.

Inquiry knocks persistently at nature's storehouse; it seeks to discover and to make useful what lies within. As it fumbles its way along it has often been stopped but as yet has encountered no ultimate barriers. Nature has, so far as we are now aware, set no limit to

what the universe holds; it is our limited understanding, or our failure to contrive ways and means, which sets bounds. As the world of material resources is enlarged, a wider and wider world stands out dimly to invite conquest. The wherewithal for a standard in keeping with the dignity of human life is all about us. The general welfare, promised by the Constitution and still unrealized, is not blocked by nature and must not be blocked by the artificial barriers which man erects against man.

A crisis in the history of the Nation is upon us. If the common good is to be served, an economics of scarcity must give way to one of abundance. The right of a man to his own exists within the commonwealth; he may do as he pleases with that which is his property. But liberty and property stop short at the line marked out by the general welfare. Long ago law joined policy to decree that no man is to exploit his wealth in such a way as to create a scarcity, make for a lower standard of life, or drive a barrier between a people and their resources. The great task of Government is to realize these ancient values in the conduct of the modern industrial republic; to this great task the productive genius of a people must be encouraged to contribute, unrestrained by private claims in the economy. The imprisonment of invention and production spells doom; the nation which discovers how to release to mankind the great storehouse of creative energy shall inherit the earth.

TABLE OF CASES

	Page
<i>Adams v. Burke</i>	54, 55, 56, 57, 63, 73, 81, 85
<i>Adrian Platt and Co. v. National Harrow Co.</i>	47
<i>Albany Paper Co. v. Morgan Envelope Co.</i>	63, 66, 68, 74, 85
<i>Allegeyer v. Louisiana</i>	158
<i>Altoona Public Theatres v. American Tri-Ergon Corp.</i>	132
<i>American Equipment Co. v. Tuthill Building Materials Co.</i>	69
<i>American Gramophone Co. v. Pickard</i>	65
<i>American Lechithin Co. v. Warfield Co.</i>	69
<i>Barber Asphalt Co. v. Stulz Sickles Co.</i>	83
<i>Bassick Mfg. Co. v. Adams</i>	85
<i>Bassick Mfg. Co. v. Hollingshead</i>	60, 85, 134
<i>Bauer et Cie v. O'Donnell</i>	64, 73, 74
<i>Bement v. Harrow</i>	59, 60, 62, 69, 78, 81, 82, 84
<i>Bloomer v. Millinger</i>	54, 57, 85
<i>Bloomer v. McQuewan</i>	54, 55, 56, 63, 71, 72, 73, 81, 85
<i>Blount Mfg. Co. v. Yale and Towne Mfg. Co.</i>	78, 79
<i>Bobbs-Merrill Co. v. Straus</i>	73
<i>Boesch v. Graff</i>	165
<i>Boston Store v. American Gramophone Co.</i>	64, 74
<i>British Mutoscope and Biograph Co. v. Homer</i>	84
<i>Broderick Copygraph Co. v. Mayhew</i>	65
<i>Broderick Copygraph Co. v. Roper</i>	65
<i>Carbice Corp. v. American Patent Corp.</i>	68, 69, 82, 85
<i>Chaffee v. Boston Belting Co.</i>	54, 57, 73
<i>Clip Box Mfg. Co. v. Steel Protected Concrete Co.</i>	47
<i>Columbia Motor Car Co v. Duerr</i>	117
<i>Commercial Acetylene Co. v. Autolux Co.</i>	65
<i>Consolidated Rubber Tire Co. v. Republic Rubber Co.</i>	65
<i>Continental Paper Bag Co. v. Eastern Paper Bag Co.</i>	59, 60, 141
<i>Cortelyou v. Carter's Ink Co.</i>	65
<i>Cortelyou v. Johnson</i>	65
<i>Cortelyou v. Lowe</i>	65
<i>Cotton Tie Co. v. Simmons</i>	56, 63
<i>Crown Cork and Seal Co. v. Brooklyn Bottle Stopper Co.</i>	65
<i>Darcy v. Allen</i>	13
<i>Detrola Corp. v. Hazeltine Corp.</i>	137
<i>Dr. Miles Medical Co. v. Goldthwaite</i>	72
<i>Dr. Miles Medical Co. v. Joyner Drug Co.</i>	72
<i>Dr. Miles Medical Co. v. Park</i>	73, 81
<i>Edison Phonograph Co. v. Pike</i>	72, 73
<i>Edwards v. Picard</i>	84
<i>Electric Vehicle Co. v. Duerr</i>	117
<i>Ensten v. Simon, Ascher and Co.</i>	138
<i>Essex Razor Corp. v. Gillette</i>	132
<i>Ethyl Gasoline Corp. v. U. S.</i>	69, 83, 147, 160
<i>Evans v. Eaton</i>	36, 52
<i>Evans v. Hettich</i>	36, 52
<i>Evans v. Jordan</i>	36, 52
<i>Evart Mfg. Co. v. Baldwin Cycle Chain Co.</i>	58
<i>Ex parte Wood</i>	52
<i>Ferguson Inc. v. Lechithin Corp.</i>	69
<i>Fowler v. Parke</i>	71, 141
<i>Frey and Son Inc. v. Cudahy Packing Co.</i>	75
<i>F. T. C. v. Beech Nut Packing Co.</i>	76

	Page.
<i>F. T. C. v. Goodyear Tire and Rubber Co.</i> -----	100
<i>F. T. C. v. Racine Paper Goods Company</i> -----	47
<i>General Electric Co. v. De Forest Radio Co.</i> -----	137
<i>General Electric Co. v. Independent Lamp and Wire Co.</i> -----	137
<i>General Talking Pictures Co. v. Western Electric Co.</i> -----	14,
	52, 55, 60, 73, 74, 84, 97, 160
<i>Gibbons v. Ogden</i> -----	37
<i>Grant v. Raymond</i> -----	52
<i>Hammer v. Dagenhart</i> -----	148
<i>Harrison v. Glucose Co.</i> -----	72
<i>Harrow v. Hench</i> -----	78
<i>Hazeltine Corp. v. Abrams</i> -----	137
<i>Heaton-Peninsula Button-Fastener Co. v. Eureka Specialty Co.</i> -----	58
	60, 62, 64, 65, 68, 72, 82, 85
<i>Hench v. Harrow</i> -----	79
<i>Henry v. A. B. Dick Co.</i> -----	58, 65, 68, 82, 85
<i>Heyer v. Duplicator Mfg. Co.</i> -----	68, 85
<i>Hobbie v. Jennison</i> -----	74
<i>Hoe v. Knapp</i> -----	58, 141
<i>Indiana Mfg. Co. v. Case Threshing Co.</i> -----	78
<i>Ingersoll & Bro. v. McColl</i> -----	65
<i>Interstate Circuit Inc. v. U. S.</i> -----	83, 84, 147, 159
<i>International Business Machines Corp. v. U. S.</i> -----	67
<i>Jayne v. Lader</i> -----	73
<i>Keeler v. Standard Folding Bed Co.</i> -----	64, 73, 74
<i>Kendall v. Winsor</i> -----	53
<i>Keplinger v. De Young</i> -----	52
<i>Leeds and Catlin v. Victor Talking Machine Co.</i> -----	64, 68, 85
<i>Leitch Mfg. Co. v. Barber Co.</i> -----	68, 69, 82
<i>Livingston v. Van Ingen</i> -----	37
<i>Lord v. Radio Corp. of America</i> -----	67
<i>Lovell-McConnell Mfg. Co. v. Waite Auto Supply Co.</i> -----	65
<i>Lynch v. Magnarox Co.</i> -----	79
<i>Mackay Radio v. R. C. A.</i> -----	131
<i>Mayhew v. Broderick Copygraph Co.</i> -----	65
<i>McChurg v. Kingsland</i> -----	56
<i>McGrath Holding Corp. v. Anzell</i> -----	85
<i>Mitchell v. Hawley</i> -----	54, 55, 57, 60, 64, 73, 85
<i>Motion Picture Patent Co. v. Universal Film Co.</i> -----	66, 67, 68, 69, 79, 82, 85
<i>Mowry v. Whitney</i> -----	130
<i>National Harrow Co. v. Hench</i> -----	78
<i>New State Ice Co. v. Liebmann</i> -----	114, 158
<i>Ogden v. Gibbons</i> -----	37
<i>Oxford Varnish Co. v. Alt & Wiborg Corp.</i> -----	67
<i>John D. Park & Sons v. Hartman</i> -----	73
<i>Parsons Nonskid, Ltd., v. McKinnon Chain Co.</i> -----	65
<i>Pearsall Butter Co. v. F. T. C.</i> -----	67
<i>Pennock v. Dialogue</i> -----	52, 56
<i>Philad Co. v. Lechler Laboratories, Inc.</i> -----	69
<i>Pick Mfg. Co. v. General Motors Corp.</i> -----	67
<i>Pope Mfg. Co. v. Gormally</i> -----	60
<i>Registering Co. v. Sampson</i> -----	64
<i>Remington-Rand, Inc., v. International Business Machines Corp.</i> -----	78
<i>Rubber Tire & Wheel Co. v. Milwaukee Rubber Co.</i> -----	78
<i>Schriber-Schroth v. Cleveland Trust Co.</i> -----	131
<i>Shaw v. Cooper</i> -----	52
<i>Sinclair Refining Co. v. F. T. C.</i> -----	67
<i>Standard Fashion Co. v. Magrane Houston Co.</i> -----	67
<i>Standard Sanitary v. U. S.</i> -----	65, 66, 68, 69, 79, 81, 85
<i>Straight Side Basket Corp. v. Webster Basket Co.</i> -----	69
<i>Straus v. American Publishers' Association</i> -----	74
<i>Straus v. Victor Talking Machine Co.</i> -----	64, 74
<i>Sullivan v. Fulton Steamboat Co.</i> -----	37
<i>The Telephone Cases</i> -----	88
<i>Triplett v. Lowell and Dunmore</i> -----	138

	Page.
<i>Tyler v. Tuel</i>	52
<i>United Electric Co. v. Creamery Package Co.</i>	47
<i>U. S. Fire Escape Counterbalance Co. v. Joseph Halsted Co.</i>	65
<i>U. S. v. A. Schrader & Son, Inc.</i>	75
<i>U. S. v. American Bell Telephone Co.</i>	90, 130
<i>U. S. v. American Bell Telephone Co. (second)</i>	103, 130
<i>U. S. v. American Bell Telephone Co. (third)</i>	130
<i>U. S. v. Colgate Co.</i>	75
<i>U. S. v. Darby Lumber Co.</i>	148
<i>U. S. v. Eastman Kodak Co.</i>	47
<i>U. S. v. General Electric Co.</i>	58, 59, 60, 62, 69, 76, 80, 81, 98, 99, 102
<i>U. S. v. General Electric Co. (second case)</i>	103
<i>U. S. v. Hartford Empire Co.</i>	118
<i>U. S. v. New Departure Mfg. Co.</i>	79
<i>U. S. v. Patterson</i>	47
<i>U. S. v. Porcelain Appliance Corp.</i>	130
<i>U. S. v. Standard Oil of Indiana</i>	69, 79, 130
<i>U. S. v. United Shoe Mach. Co.</i>	62, 66, 67, 68
<i>U. S. v. Winslow</i>	65
<i>Victor Talking Machine Co. v. The Fair</i>	72, 73
<i>Vulcan Mfg. Co. v. Maytag Washer Co.</i>	67
<i>Waltham Watch Co. v. Keene</i>	65
<i>Westinghouse Electric and Mfg. Co. v. Diamond State Fiber Co.</i>	68
<i>Winchester Repeating Arms Co. v. Buenger</i>	65
<i>Winchester Repeating Arms Co. v. Olmstead</i>	65
<i>Wilson v. Rousseau</i>	53, 55, 56, 71
<i>Wilson v. Simpson</i>	55, 56, 63, 68
<i>Yale and Towne Lock Co. v. Blount Mfg. Co.</i>	59

